AUGUST 3, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

RESEARCH

LLING METHODS

ION PERSONNEL TRAINING

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Distribution Outmoded?

Some of it is. But if you get up to date on new techniques, you can distribute your way to better profits

— see p. 57

PROGRAM FOR MANAGEMENT

No. 6 of a Management Series

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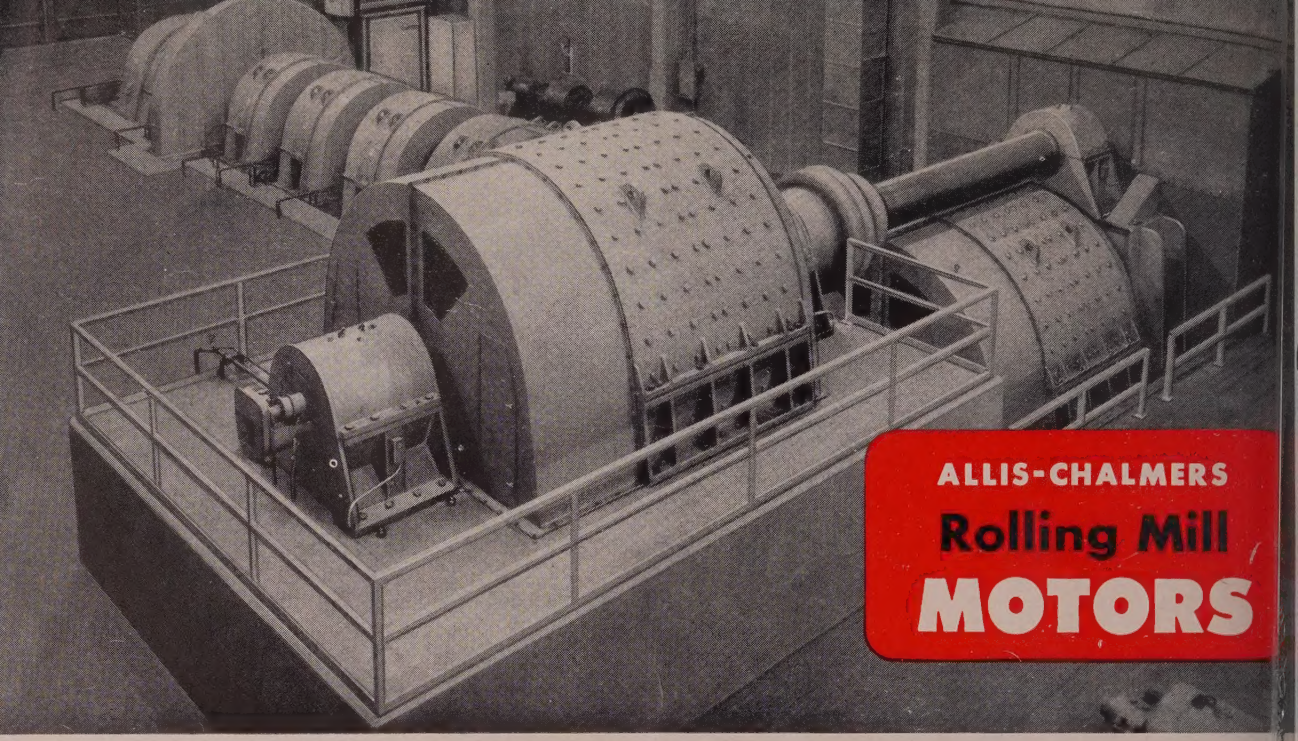


Shakedown Time ZERO!

Installation completed April 1. Production started April 2—at 200 tons an hour.

That's the story of the missing shakedown run at Granite City Steel Company's new 45 by 115-inch, two-high reversing blooming mill. (Eight days later the old blooming mill was torn out, since it was obvious that temporary standby equipment was not needed.)

All electrical equipment for this mill was supplied by Allis-Chalmers. Pictured above is the 10,000-hp, 40/80-rpm twin drive and supporting flywheel and excitation m-g sets. A-C is also furnishing the electrical equipment for a new roughing mill and revamping a finishing mill.

Completion of their current $50,000,000 expansion program later this year will give Granite City Steel a capacity well over a million ingot tons a year.

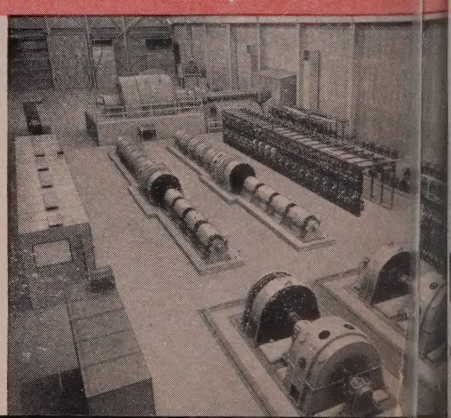
To see how much A-C's wide experience with metal rolling applications can benefit you, call your nearest A-C steel mill representative, or write to Allis-Chalmers, Milwaukee 1, Wisconsin. A1 00

ALLIS-CHALMERS

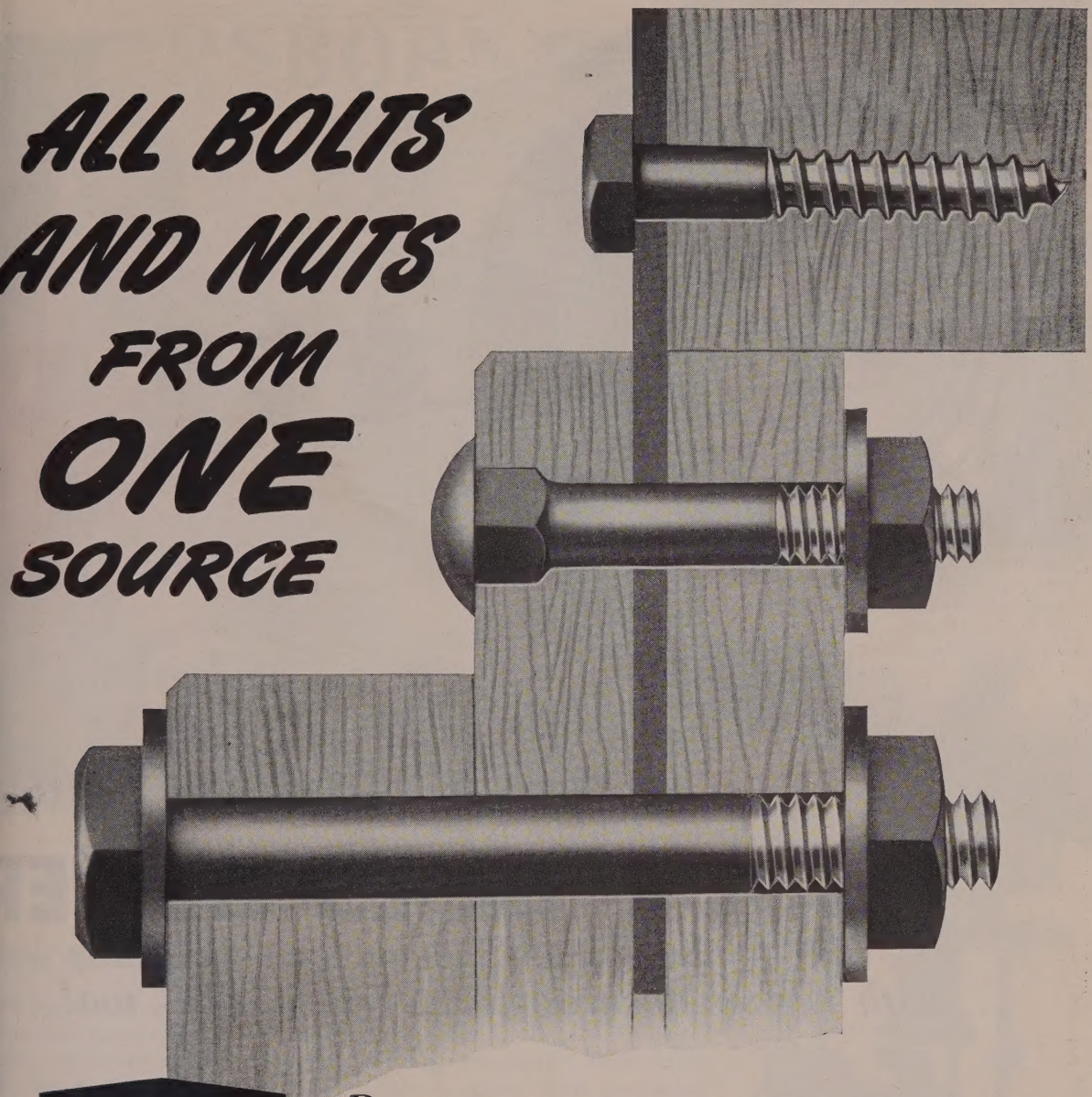
At left, Granite City Steel's new blooming mill viewed from the main pulpit.

Over-all view of motor room (right) shows ac control and switchgear at left; constant and variable voltage m-g sets in center; dc control panels and *Regulex* exciter sets at right; and the two 5000-hp twin-drive motors and m-g sets in background—all supplied by Allis-Chalmers.

Regulex is an Allis-Chalmers trademark.



ALL BOLTS AND NUTS FROM ONE SOURCE



BETHLEHEM STEEL

Did you know there is a Western manufacturer who makes a full line of bolts and nuts? There is—Bethlehem Pacific. What's more, this company produces a full line at its three plants, in Los Angeles, South San Francisco, and Seattle.

The Bethlehem Pacific line includes bolts, nuts and other standard items in hundreds of individual sizes. In addition, special fasteners for unusual applications are also made at each of the three plants.

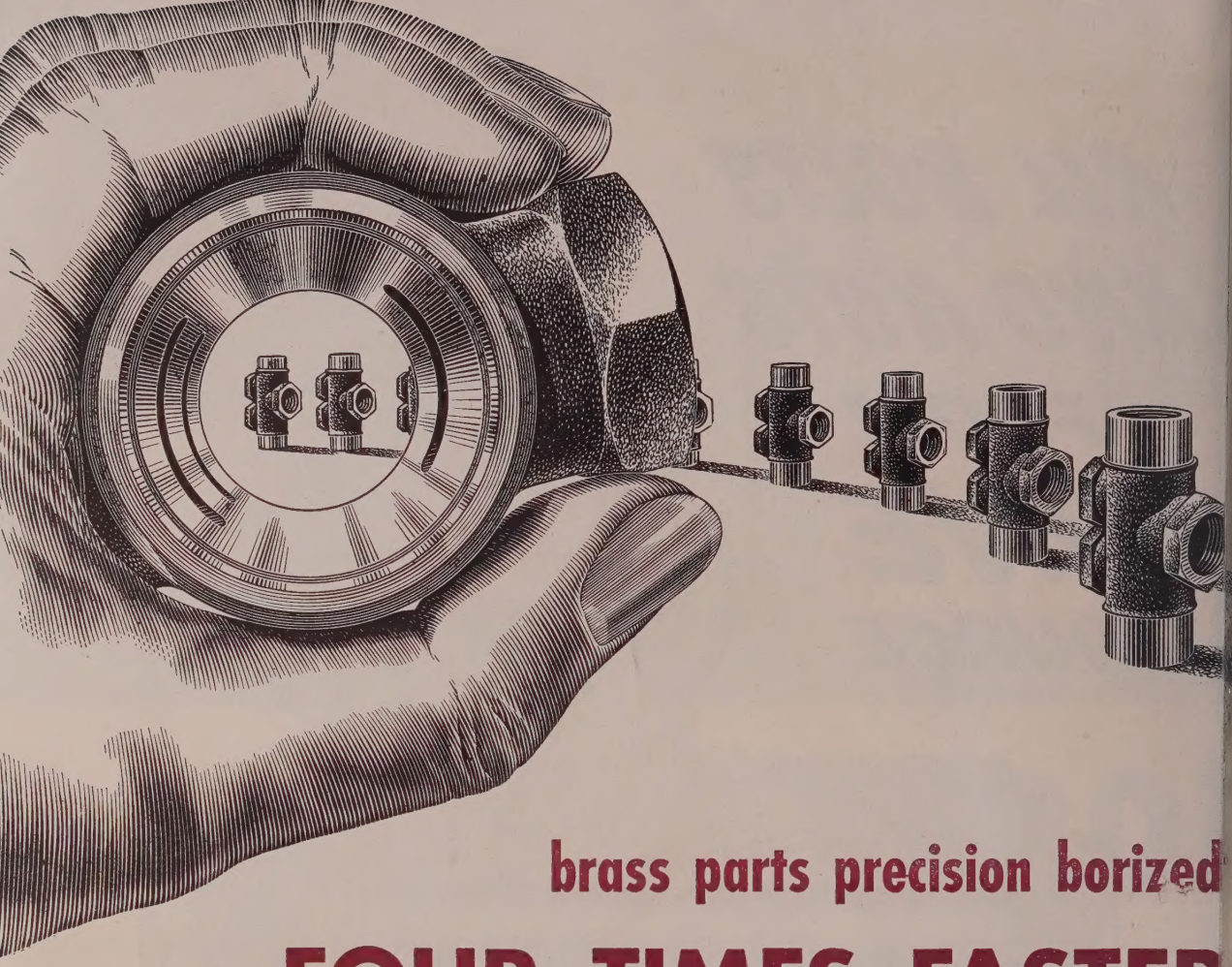
This set-up provides you with a single, convenient source. It does not matter where you are located, or whether you buy standard or special items, you will find that Bethlehem Pacific can give you fast service.

The quality of Bethlehem Pacific bolts and nuts can't be beat. They are clean, strong and uniform, with smooth-fitting threads. They will please your most exacting customers. Call any of our sales offices and ask for more information.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Sales Offices: Los Angeles, San Francisco, Portland, Seattle, Spokane, Honolulu

BETHLEHEM PACIFIC



brass parts precision borized

FOUR TIMES FASTER

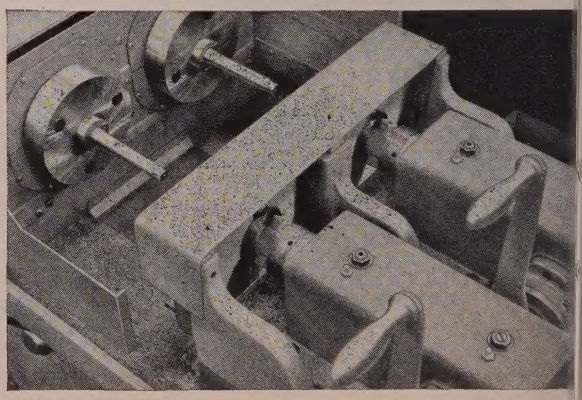
. . . with higher accuracy and better finish, too!

No wonder this Heald customer is pleased.

Compared to the method previously used, his new Bore-Matic has multiplied air-valve production *four times!*

This one machine, a Model 124 Bore-Matic, finishes 15 different sizes and types of valve bodies. What's more, borizing of the rough-reamed parts produces a bore that's straight, round and within .0002″ for size. Scrap losses have dropped to the vanishing point. And the new machine is far easier to operate, requiring less operator training.

Remember—when it comes to precision finishing, it pays to come to Heald.



Internal and Rotary Surface Grinding Machines and Bore-Matics

HEALD

THE HEALD MACHINE COMPANY

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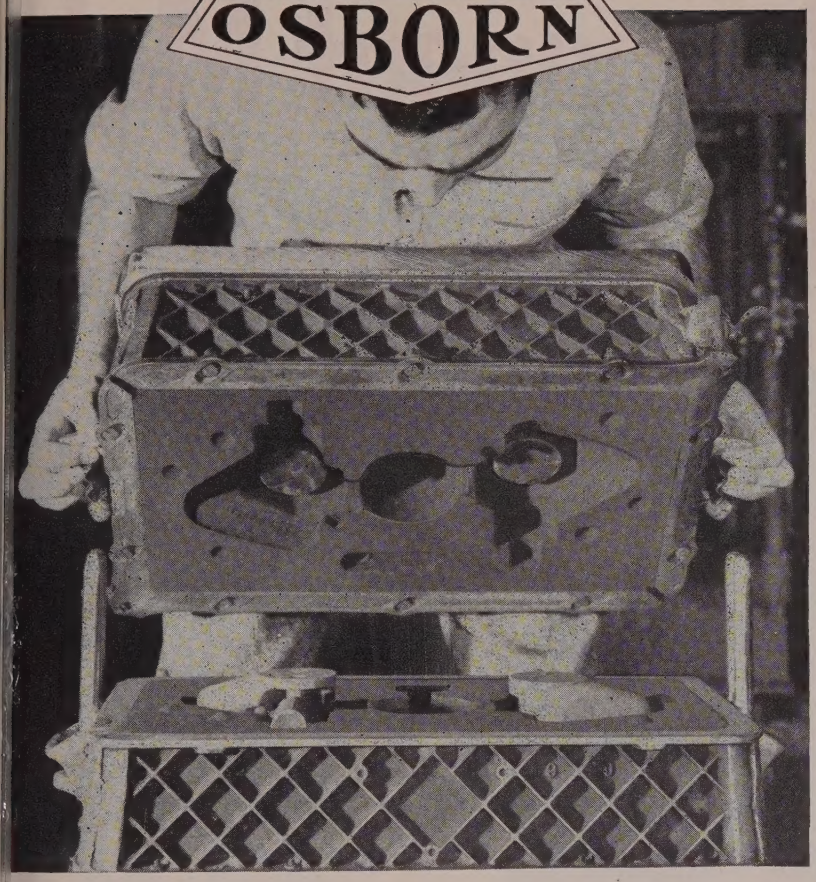
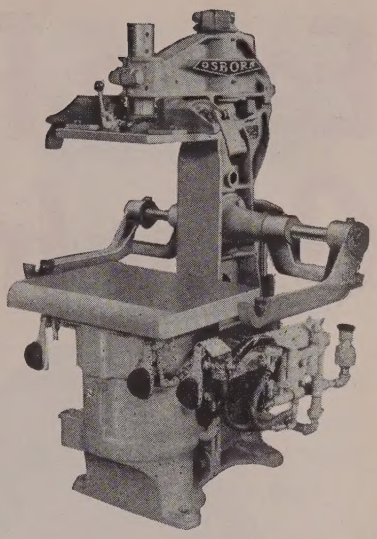
Offices in Chicago • Cleveland • Dayton • Detroit • Indianapolis • New Yo

OSBORN





MECHANIZES MOLDING OPERATIONS—With Osborn's Rota-Lift it is now economical to machine mold large castings formerly made on the bench or on the floor from match-plate patterns. The Rota-Lift mechanically handles the mold as well as rams the sand.

INSIDE STORY...

How quality castings cut machining costs

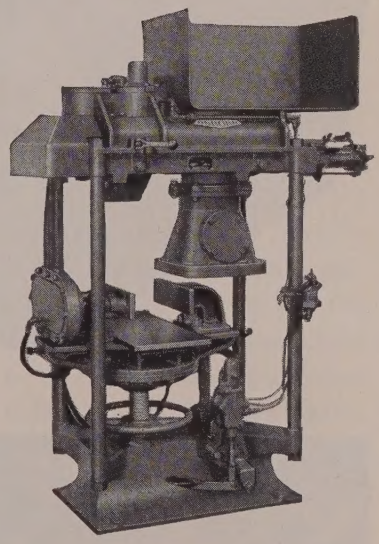
Look inside your molds for clews . . . castings can be only as accurate and uniform as the molds in which they are produced. Simply by improving the quality of your foundry molds through use of modern molding and core blowing machines, it is possible to reduce both machining and initial casting costs. Here's how:

First, less time is needed to load uniform castings in chucks or holding fixtures. Extra grinding operations on oversized castings are eliminated.

Second, uniformity of machine rammed molds and cores reduce scrap casting losses. Machines make molds and cores faster too.

Third, uniform castings cut machining time . . . less metal is needed for finishing.

Learn what new mechanical advancements can now be applied to your operations to improve the quality of your molds, increase production and cut costs. Write *The Osborn Manufacturing Company, 5401 Hamilton Avenue, Cleveland 14, Ohio. Dept. EE-8.*



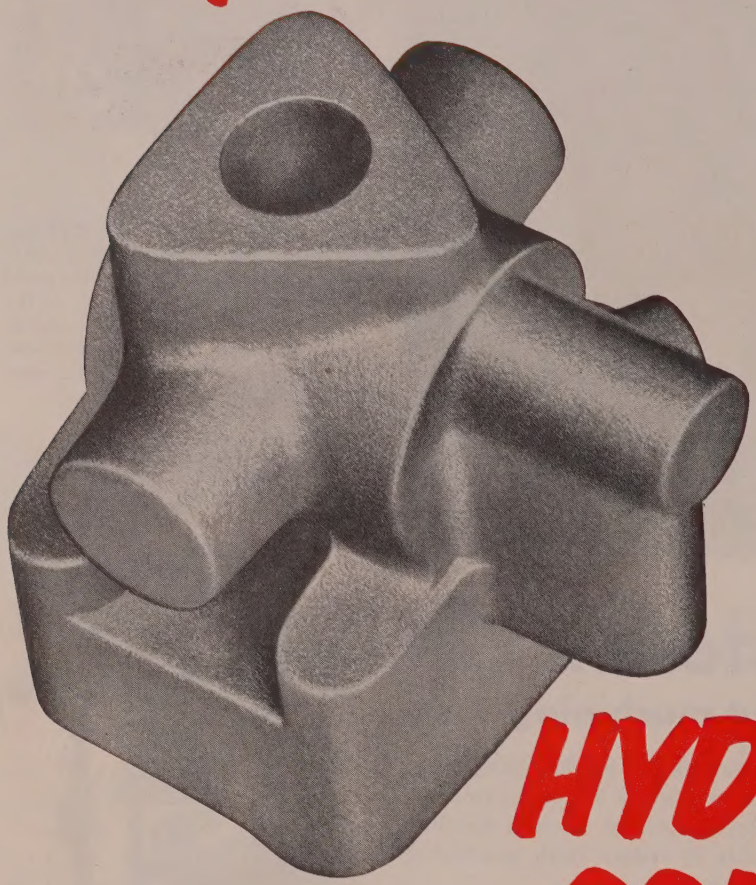
DIAPHRAGM-TYPE CORE BLOWING MACHINE equipped with horizontal air clamps for vertically parted core boxes. Draw type machines also available.

Serving the Foundry Industry for 43 Years

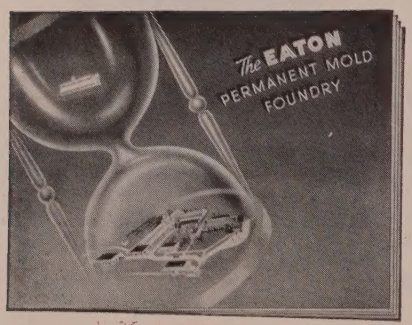
Osborn Molding Machines

MOLDING MACHINES...CORE BLOWING MACHINES...INDUSTRIAL BRUSHES

Eaton Permanent Mold Gray Iron Castings—



for HYDRAULIC CONTROLS



Send for your free copy of the 32-page illustrated booklet: "The Eaton Permanent Mold Foundry." It tells the story of Permanent Mold Castings and takes you on a picture-tour of the Eaton Foundry at Vassar, Michigan.

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This Week in Metalworking

STEEL

Vol. 133 No. 1 August 1, 1953

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That's close enough for the most critical control requirements. Actual performance demonstrates that it is being done with a simple electrical unit—automatically. No attention is needed, the operator simply selects the control point on the controller.

A Gordon XACTLINE in the control circuit actuates the control before the set temperature is reached (up or down). The short on-off cycle (as short as three seconds) thus produced will give extremely close control. Because it's electrical—with no dependence on gears, cams, shafts, etc.—it is accurate and reliable.

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Gordon XACTLINE—a complete, factory-assembled, factory-adjusted instrument enclosed in dustproof case, ready for installation anywhere.

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behind the scenes

Another Plus!

It's getting to be nine o'clockish (p.m. that is) and it's quiet on "number eight" as we fumble with our typewriter keys. Seems like we can almost feel the rhythmic surge of the giant presses downstairs. They're humming tonight as they do every night. As you know, getting STEEL out is a round-the-clock operation.

They're busy on "number nine" tonight, too. Bob Huber, machine tool editor, and a special staff are hard at it sifting facts and figures into a pattern which will eventually become STEEL's *Machine Tool Buyers' Guide*. Here is a brand new editorial service for all of you in plants doing production machining. We'd like to take a few secs to describe it.

The package contains two major sections: (1) *Special Trend Reports*—Here users and prospective buyers of machine tools will find specific data regarding capacities, new design, new techniques, etc., upon which they can base future production planning. In this section they will also find material to help them determine policies regarding equipment purchases and replacement. (2) *The Buyers' Guide Section*—Here prospective buyers will find a detailed listing of each type of machine tool available and where it can be bought. Machines will be recorded by type, size and manufacturer. More than 20,000 individual listings will be indexed for quick reference.

The guide promises to be the ideal companion piece to your *Specifications Handbook* and *Guide for Stainless Steel Buyers*. The plan is to publish it as a supplement to the Oct. 26, 1953, issue.

Huber and his staff think they've really got something you need and want. Better be on the lookout for it!

Polynesian Puzzler

We're going to draw on our supply of South Sea Island jargon to set up this problem for you.

The scene is a remote island in the Pacific where the inhabitants are divided into two hereditary castes. To an outsider, the members of these castes look entirely alike. But those in one caste, the Arbus, always tell the truth; those in the other, the Bosnins, always tell the opposite of the truth.

To this island one day, there came an explorer who knew something of the customs, but little of the language. As he landed, he met three natives—Abl, Bsl, and Crl.

"Of what caste are you?" the explorer asked Abl.

"Bhsz cjnt dkpv flgqw mrx," said Abl.

"What did he say?" asked the explorer, addressing Bsl and Crl, both of whom had learned some English.

"He say he Arbu," said Bsl.

"He say he Bosnin," said Crl.

Now, you tell us, *to which caste do Abl, Bsl and Crl belong?*

Cover Picture

No step back in time . . . our cover picture was taken on July 2, 1953, by

the United Press Photo Service.

Actually, the locale is the great metropolitan city of Philadelphia where horse-drawn postal wagons are still rolling side-by-side with their mechanized cousins.

We wonder if there is a special charge for "horse-mail"?

The Winnah!

First with the correct answer to our puzzler of July 20, 1953, was L. D. Rice, in the Quality Control Department at Timken Roller Bearing Company in Canton, Ohio.

Here's the solution: *Peter is Dick's father.*

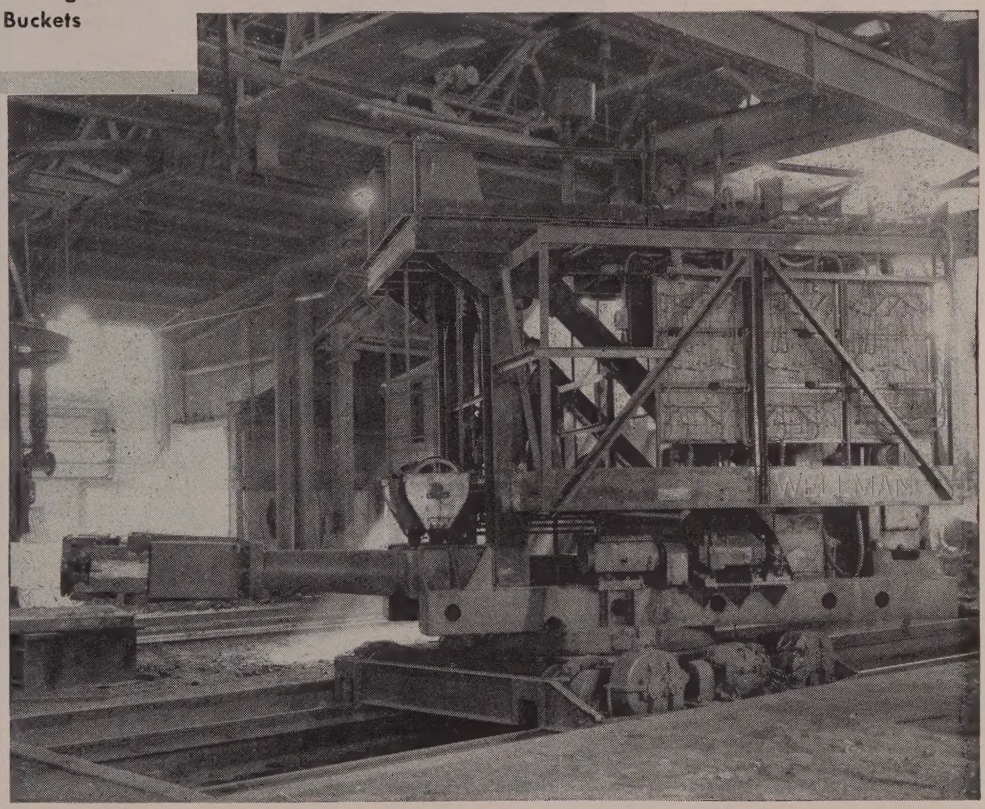
Shrdlu

(Metalworking Outlook—Page 41)

Wellman will build it

Special Cranes
Forging Manipulators
Charging Machines
Ore Unloaders
Car Dumpers
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Mine Hoists
Skip Hoists
Ore and Coal Bridges
Clamshell Buckets

Wellman forging manipulators handle big ingots speedily, efficiently



Wellman Forging Manipulator with white-hot ingot ready for forging.

● Wellman Forging Manipulators hold hot steel ingots on anvil dies, turn them and keep them level for efficient forging . . . despite hammering shocks. You can count on *all* Wellman equipment for speedy, economical service. It is backed by more than a half century of leadership in designing manufacturing and construction of heavy materials handling facilities.

THE WELLMAN ENGINEERING COMPANY

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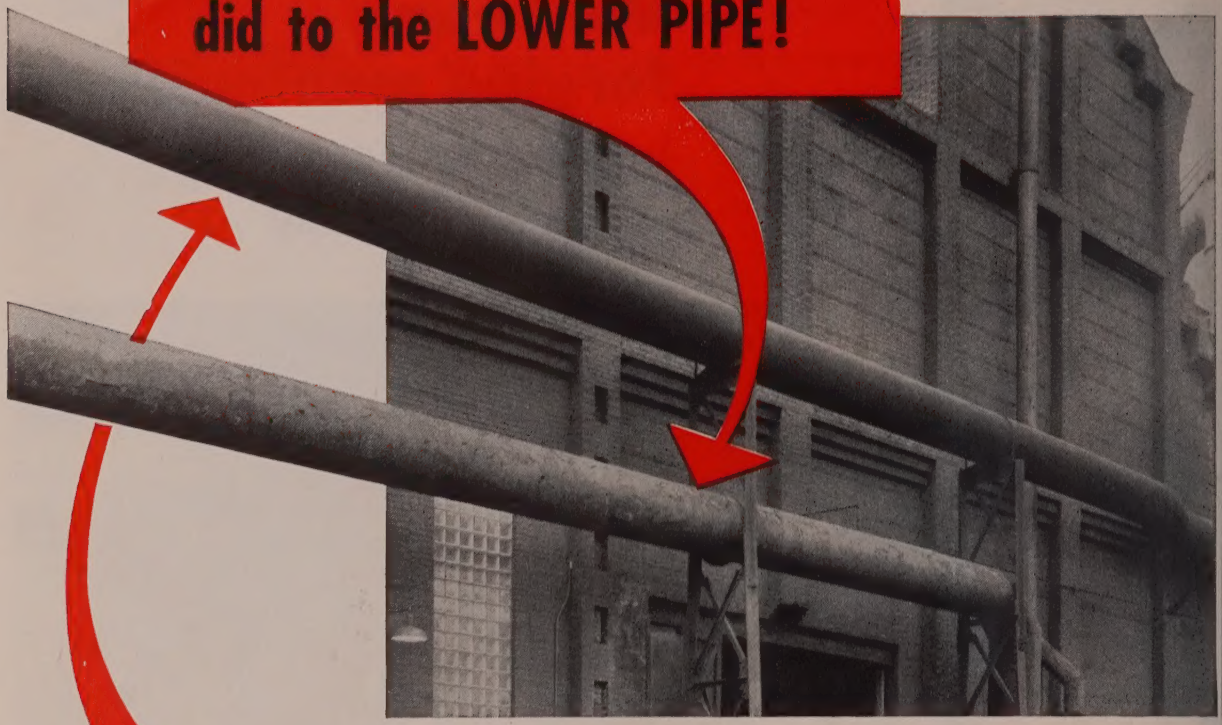
Look what coke quenching did to the LOWER PIPE!



THEN LOOK AT THE UPPER PIPE *completely protected* BY INSUL-MASTIC

The top pipe in this unretouched photograph has a three year old coating of INSUL-MASTIC, the *Superior* protective coating. The bottom pipe has been painted several times during those three years. These pipes are in a steel mill and both are constantly showered with acid vapors from a coke quenching tower which is around the corner of the building. So strong are the vapors that they sting the faces and arms of workmen, but three years of this punishment have not harmed the INSUL-MASTIC coated pipe.

Steel mills throughout the country are learning that INSUL-MASTIC lasts for years and years and practically eliminates maintenance and replacement of metal equipment. These coatings are extremely resistant to acids, alkalis and moisture. They are specially made that way. The generous use of Gilsonite, one of nature's most chemically resistant minerals, helps give this lasting protection.

Save your tanks, structural steel, pipes, quench cars and everything on or near your coke batteries. Do as other mills are doing. Specify INSUL-MASTIC for coating this equipment.

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Think First of the Coatings that last!

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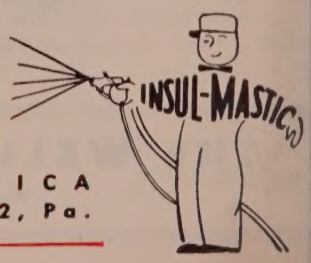

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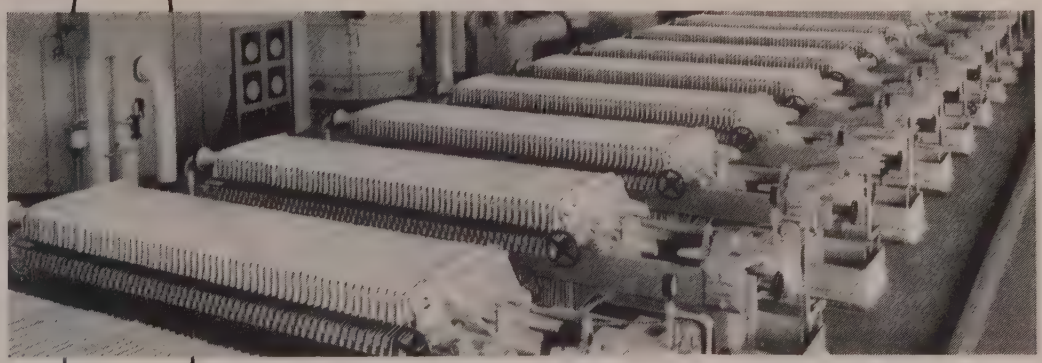
We all owe a debt of gratitude to the manufacturers of food and chemical filtering equipment, for they have kept pace both in design and production with the expanding demand for high speed, complex filtration equipment. We at COOPER ALLOY, joining in this salute, take pride in our close association with the engineers and designers who have made these advances possible. From the producer of small laboratory filters, to the creator of huge production designs, the filter manufacturer knows that in COOPER ALLOY he has found a source for cast stainless steel components in whom he can place his trust. Our thirty



years of experience as the leading producer of corrosion resistant stainless castings, is your guarantee of a partnership that lasts. If you design or manufacture filters for the handling of corrosive liquids or foods, you should get to know us better. Send for your free copy of "Thirty Years of Progress" today!

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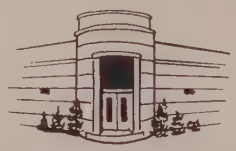
But, he couldn't figure out a way • • • to make more than 100 a month . . . without a big capital investment

Until he talked to Pioneer Engineering • • • • •



Now, he makes 1200 a month, and his manufacturing costs are cut in half without adding any men or machines!

Everyone knows the best way to cut costs is through increased productivity. Contrary to the conception of increased production only through more men and machines, Pioneer does it a better way

Take the product mentioned above for example. We made a complete product manufacturing study of the unit. This included tolerance liberalization, interchangeability of parts, functional requirements of parts and overall economy of production.

Our study, coupled with correct functional design and the reprocessing and design of proper tools and gages cut manufacturing costs 50% and increased production 1200%.

And the product manufacturing study cost only $1800!

Write today for Bulletin 162-A which describes our complete engineering services in detail.

Pioneer ENGINEERING & MANUFACTURING CO., INC.

19662 John R Street, Detroit 3, Michigan

LETTERS TO THE EDITORS

Management Series Approved

May I compliment you on STEEL's Management Series No. 5, "Forecasting Business Trends" (June 29, p. 47). This is the most comprehensive over-all treatment of this subject that I have ever seen in condensed form. It fills a long standing need in this field and it is to be hoped that those in the proper positions of management will be influenced by this informative treatise.

It should also confirm management's opinion of STEEL as the leader in its particular field of industry.

I have carelessly lost or misplaced my copies of numbers 1 and 3 of this series ("Public and Community Relations," Feb. 23, p. 53; "Research, Basic and Product," Apr. 27, p. 55) and I am wondering if it is now possible to get two reprints of these articles.

H. R. Malcoln
Carpenter Advertising Co
Clevelanc

• *Copies have been sent.—ED.*

We found your article "Forecastin Business Trends" very worthwhile. Ma we have six copies, please?

A. A. Widtman
Department of Business Plannin
A. O. Smith Corp
Milwauke

I will appreciate receiving tear sheet of this interesting article.

W. E. Hartlan
associate director of purchase
Thompson Products Inc
Clevelan

I enjoyed very much reading your ar ticle "Forecasting Business Trends."

I think this is so valuable that would like to have several copies t give to my associates. Would you b kind enough to send me 12 reprints.

Francis A. Lackner J
manager, Commercial Researc
Cherry-Burrell Cor
Chica

I have just read the "Forecastin Business Trends" article and a ver fine, searching piece it is.

However, for the record I would lik to cite one section of this article whic mentions a number of associations i cluding AMA, and alluding to the grou as having chapters in different cities.

While all the other groups listed hav chapters, as far as I know, the Americ Management Association has no regio al or local units. All of our meeting a tivities are planned and directed fro our management center in New Yor using our own skilled personnel, be the conferences or workshop seminars.

All of our publications and other mer

Please turn to page 12

BARS

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carbon and alloy · stainless steel
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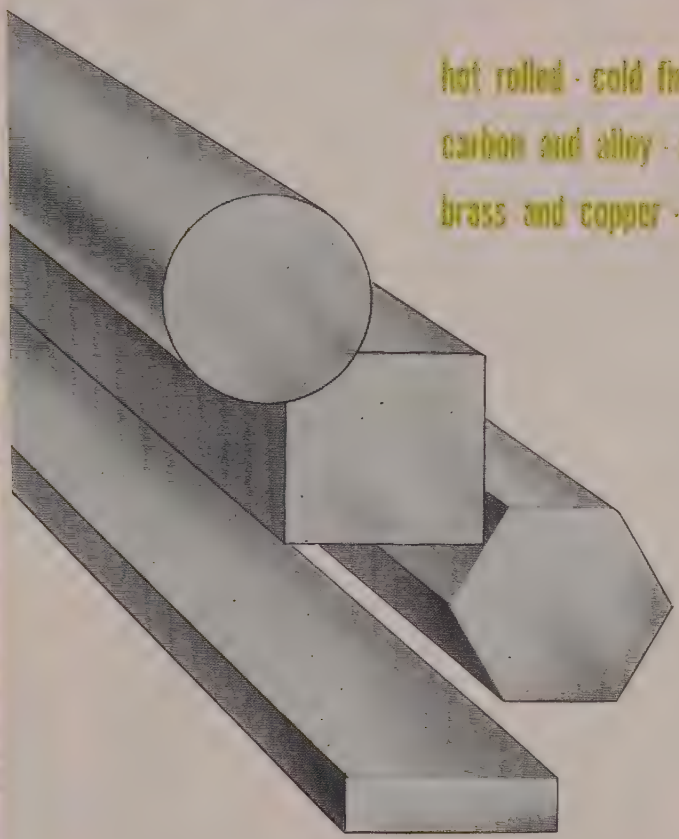
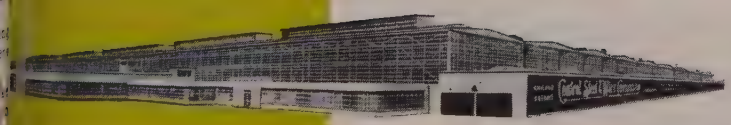


many analyses in
wide size ranges
cut to your lengths or multiples



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LETTERS

Concluded from page 10

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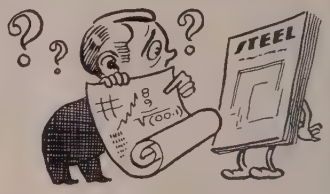
Donald G. Keen
public relations director
American Management Association
New York City

Problem in Engineering



The writer intends to sell a window cleaner under his own trade name. The manufacture of it is to be sublet to old line firms. Making the metal fitting between a wood handle to the sponge washer holder is my problem.

How can this best be arranged? Can aluminum tubing be easily bent either hot or cold? Would a piece of aluminum rod material be better? Can either be satisfactorily bent hot or cold, or isn't it adaptable to a short bend without a serious strain? What is the best way to arrive at this solution? Can you refer me to several leading firms who can make the finished product?

Clem Ernst
Gallaher Building
Sidney, O.

• *From the description of your product, it appears that aluminum tubing is a likely prospect to fill your requirements. Aluminum has several advantages, including light-weight and corrosion resistance. Of course, rod is stronger than tubing, but your application does not seem to call for high strength. There is a chance that the flattening and bending you have in mind may require tubing made from annealed sheet. In general, your radius will depend on tube diameter and ratio of wall thickness to diameter. Answer here will hinge on such variables as nature of the forming operation, alloy used, its temper, etc. For the specific information you seek, we refer you to the three primary aluminum producers: Aluminum Co. of America, 2156 Gulf Bldg., Pittsburgh 19; Reynolds Metals Co., 2591 S. Third St., Louisville 1, and Kaiser Aluminum & Chemical Corp., First National Tower, Akron 8, O.—ED.*

Steel Alloys Coming Up

Can you tell us if there is any chart or reference in the handbook of the American Iron & Steel Institute that indicates the minimum yield strength of low-alloy, high-strength steel? In the event this information is not embodied in the handbook of the American Iron & Steel Institute, do you know in what other handbook or reference we might find it?

A. J. Woltering, president
Queen City Mfg. Co.
Cincinnati

• *Such information is not available from the American Iron & Steel Institute at this time. Because of growing interest in this field, STEEL plans a complete report on these alloys in the near future.—ED.*

The trend is to more deep drawn stampings with BLISS presses

Bliss 650-Ton Single-Crank Toggle Drawing Press, latest addition to Transue & Williams' press room, is producing deep drawn stampings at rate of five strokes per minute.

74%

of presses at Transue & Williams are BLISS-built!

As specialists in deep drawn parts, Transue & Williams of Alliance, Ohio, require dependable and specialized production facilities to make full use of their widely-recognized designing ability. So it's significant that they depend largely on Bliss for presses.

Of the 35 presses in the T & W shop, 26—or 74%—are Bliss-built. And practically all the larger presses, including a new 650-ton draw press, are of Bliss manufacture.

Transue & Williams average nearly 200 deep draws an hour on their Bliss presses. For *extremely deep* draws, they find that a particularly valuable feature of these presses is the combination of hydro-pneumatic die cushion and positive knockout in the bed.

The outstanding advantages Transue & Williams get in Bliss drawing presses result from Bliss' long experience in building this type of equipment. *Whatever* type of press you need, why not call in a Bliss engineer? You'll find that Bliss builds it—and builds it better.

E. W. BLISS COMPANY, CANTON, OHIO
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E. W. Bliss Company (Paris), St. Ouen sur Seine, France
PRESSES, ROLLING MILLS, SPECIAL MACHINERY
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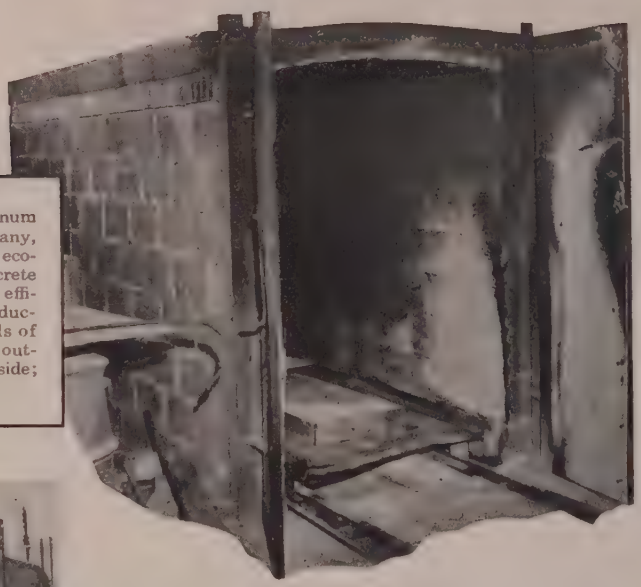
BLISS

ON YOUR PRESS IS MORE THAN A NAME...IT'S A GUARANTEE!

What's NEW in Refractories?

REFRACTORY CONCRETE BLOCKS

Speed Construction...Cut Costs



PRE-HEATING FURNACE for aluminum scrap at General Smelting Company, Philadelphia, Pa., was quickly and economically built with refractory concrete block. It was designed for peak efficiency at an estimated 30% cost reduction over conventional methods of construction. Furnace is 16' long outside, 3'9" wide and 5'9" high inside; generates temperatures to 1500°F.

UNDER CONSTRUCTION—General Smelting Company was so pleased with the performance of the pre-heating furnace they specified refractory concrete blocks again for this new calcining kiln settling chamber. Roofs of both installations are monolithic sections of refractory concrete.

Here's a new idea in refractories that promises new economies in many industrial plants. Concrete block made with *refractory* concrete chalked up a big 30% saving in construction costs on a pre-heating kiln at General Smelting Company, Philadelphia, Pa.

The large blocks were quickly placed by plant labor. No form work was needed. And they furnish both heat resistance and structural strength.

Whether in block form, or placed on the job, *refractory concrete* assures long-service life. With Lumnite* calcium-aluminate cement and suitable aggregates, it can be made to take high temperatures—often up to 2600°F. Low volume change makes it highly resistant to thermal shock, and it also resists corrosion.

FOR CONVENIENCE, you may prefer to place refractory concrete made with prepared castables (packaged mixes of Lumnite Cement and aggregates selected for specific temperatures and insulation service—add only water). They are made by refractory manufacturers and sold through their dealers. For more information, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

**"LUMNITE" is the registered trade-mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.*

S-L-82

ATLAS® **LUMNITE for INDUSTRIAL CONCRETES**

REFRACTORY, INSULATING, OVERNIGHT, CORROSION-RESISTANT

YOU CAN DRILL OR TAP TINY, PRECISION HOLES

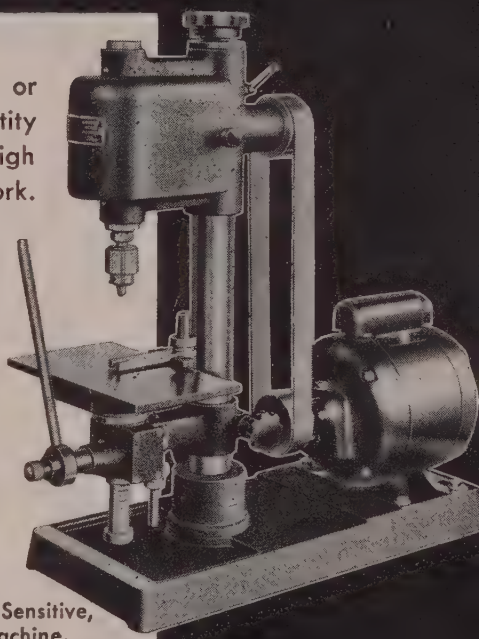
. . . ON A *PRODUCTION* BASIS . . . WITH

MINIMUM SCRAP AND *MINIMUM* TAP AND DRILL BREAKAGE

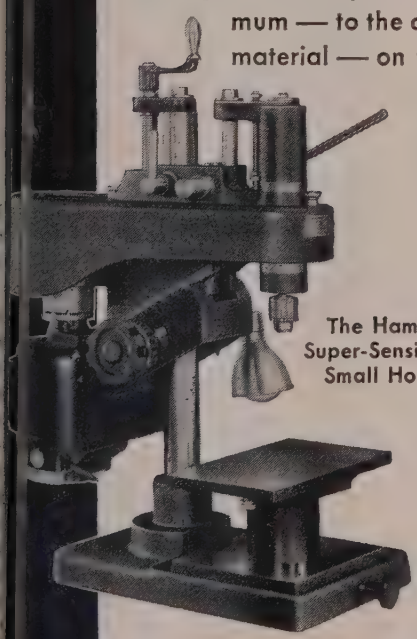
BUT YOU **MUST** FIT THE TOOL TO THE JOB

When your job calls for tiny, precision holes, drilled or tapped, rely on this; such holes can be produced in quantity and within allowed tolerances only on super sensitive, high precision machines **designed and built** for this class of work.

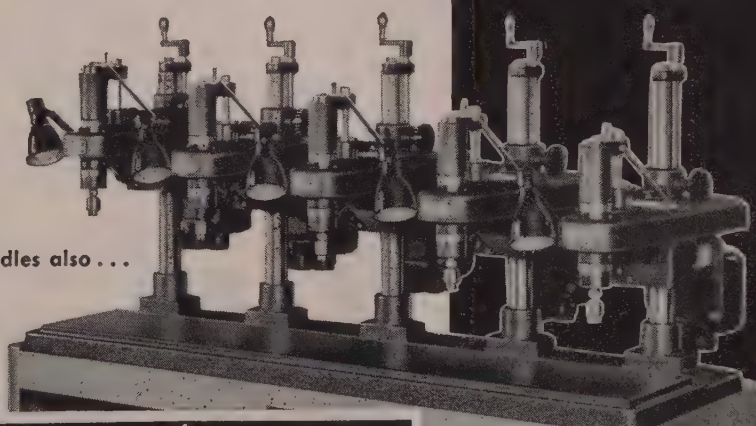
HAMILTON Drilling Machines and Tapping Machines are super sensitive and extra accurate; **designed and built** for the production of tiny, precision holes. The drilling machines produce holes **up to** 0.3125" maximum — to the center of 10" — in **any** drillable material — on fast production schedules. The tapping machine is designed to use the smallest and finest tap and **up to** 10-32 inclusive.



The HAMILTON® Super-Sensitive, Small Hole Tapping Machine.



The Hamilton VARIMATIC® Super-Sensitive, Variable Speed, Small Hole Drilling Machine.



Multiple spindles also . . .

Acquaint yourself with Hamilton Super Sensitive, Small Hole Drilling and Tapping Machines and be ready for the challenge ahead. Ask for our FREE Bulletin DT-5308.

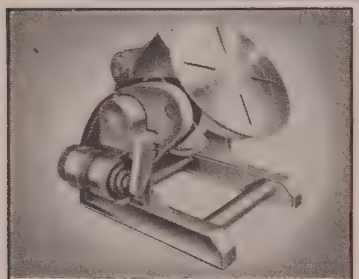
THE Hamilton TOOL COMPANY

848-30 NINTH STREET • HAMILTON • OHIO • U • S • A

REED ENGINEERING CO.

Modern Metalworking Equipment

BENDING ROLLS
TURNING ROLLS
AUTOMATIC WELDING FIXTURES



REED WELDING POSITIONER

★ Machined face with cast-in "T" slots
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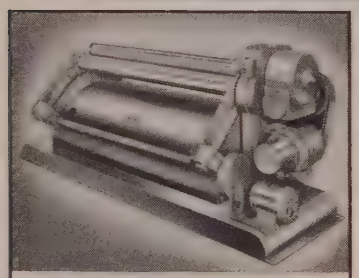
★ 1000, 2500 lb. models, hand or power tilting
★ Rotating ground connection



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★ In 18 models, ranging from 3 ft. x 10 ga. to 8 ft. x ¼" in capacity
★ Rugged, all steel construction
★ Built-in, silent worm gear drive
★ Durable, special bronze bearings
★ Power adjustment & air drop end available on most models

WE INVITE YOU . . . to write us for specifications, prices, list of REED users near you. No obligation. Just write on your letterhead.

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ANACONDA FORUM
for the Electrical Industry

REVISED ELECTRIC POWER EXPANSION PROGRAM

By: Walker L. Cisler, Chairman,
Electric Power Survey Committee,
Edison Electric Institute

FOLLOWING the outbreak of fighting in Korea in June 1950, the electric power systems of the United States promptly anticipated greatly increased power demands and revised the planned electric power expansion program sharply upwards. Between June of 1950 and April 1951, new generating projects totaling 20 million kilowatts were undertaken and orders for the equipment were placed with the manufacturers. As shown in the table, by April 1951 new projects totaling 32.1 million kilowatts were scheduled for operation, mostly before the end of 1954.

NEW POWER GOALS FOR 1956

Now, nearly two years later, the electric power expansion program has been enlarged further to total 47.7 million kilowatts planned for commercial operation in the years 1951 through 1956 and the programs for 1955 and 1956 are still incomplete. Thus within less than two years it has been necessary to plan and begin construction of projects having a generating capacity of 15.6 million kilowatts to keep pace with the electric power demands now forecast for 1954, 1955 and 1956. Approximately 4 million kilowatts of this is specifically for new requirements of the Atomic Energy Commission.

SHORTAGES HAMPER FULFILMENT

The progress which was made in 1951 and 1952 in fulfilling this program has been disappointing. In April 1951 about 16.0 million kilowatts of capacity was scheduled for operation in the two years, 1951 and 1952. Largely because of delays in obtaining materials for equipment manufacture and field construction, only 13.5 million kilowatts were completed in those two years.

The 2.5 million kilowatts which were not completed in 1952 have now been rescheduled into 1953, some projects, originally scheduled for 1953, have been rescheduled into 1954 and other projects, originally scheduled for 1954, have been rescheduled into 1955.

NEW PROGRAM CALLS FOR GREATER EFFORT

As a result of these changes, and the additions to the total program, 12.2 million kilowatts of new capacity are now scheduled for completion in 1953 and 10.6 million kilowatts in 1954. This is a truly stupendous program and because of the material shortages which have occurred during 1951 and 1952, there are grave doubts whether these goals can be met.

Great effort will be needed by all concerned to carry the program forward as closely as possible to schedule. Power requirements for 1953 and 1954 can be estimated with reasonable accuracy and capacity now planned is essential to provide satisfactory margins.

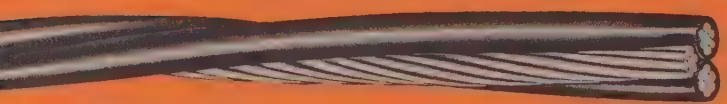
As we progress through the years, new requirements will develop, additional projects will be planned and efforts to complete them must continue unabated.

ELECTRIC POWER EXPANSION PROGRAM

Capacities Given as Millions of Kilowatts—Manufacturers Nameplate Rating

Scheduled for Operation	As of April 1, 1951	As of April 1, 1952	As of January 1953
1951	7.5	6.9*	6.9*
1952	8.5	8.9	6.6**
1953	10.7	11.9	12.2
1954	4.8	10.3	10.6
1955	0.6	4.0	9.2
1956	—	—	2.2
Total	32.1	42.0	47.7
New Capacity Planned Since April 1, 1951		9.9	15.6

*Actually completed during 1951.
**Actually completed during 1952.



SERVICE NEEDED FOR 3,750,000 UNITS BY 1956

New ANACONDA Type N-SD Service Drop Cable can help speed installation . . . available in copper or aluminum

That's the mark the nation's builders will shoot for in the next 3 years (according to F. W. Dodge Co.). Power companies must match their efforts by providing prompt and adequate electric service.

Important consideration will be given to speed, ease and appearance of installation. These requirements are met by ANACONDA Type N-SD Cable—available with either neoprene or polyethylene insulation.

This cable handles easily . . . looks neat . . . is durable . . . resists weather. Two insulated conductors are wrapped around—and fully supported by—a bare neutral messenger. Conductors remain free of tension!

RIGHT TO THE RANGE. Where Type N-SD Cable is used to the weatherhead, contractors will find SILVALINE*, ANACONDA's URC Type SE Service Entrance Cable economical to install through meter and fuse box right to such appliances as ranges, water heaters. SILVALINE has special silvery finish that won't "blotch" when painted.

*Trademark

BUILDING OR EXPANDING YOUR ELECTRICAL PLANT

In either planning a new electrical plant or correcting and improving an inadequate plant, it may save many a future headache to consider carefully these cable-selection pointers:

- An ample-size conductor always works for you.
- Choose your cable covering for its environment.
- Improve voltage regulation by using a larger conductor, reducing conductor spacing, dividing (or paralleling) circuits, improving power factor, and keeping high fluctuating load on separate feeders.
- Avoid loading feeders above 400 amperes, except in unusual cases. Above 400, cable becomes bulky, conduit expensive, difficult to install, and amount of load dropped on a fault is considerable.
- Conductor size should meet requirements for voltage regulation and current-carrying capacity for normal load and for motor circuits, short-circuit amperes.
- For greater reliability in insulated conductors, select Type RH, RH-RW, TW or Butyl-insulated instead of Type R or T.
- Aluminum conductors are satisfactory when properly installed.

"Bottlenecks" have no more place in power distribution than in shipping, accounting or administration departments. Best cure for electrical inadequacy is to install a well-designed, thoroughly engineered electrical system at the start . . . with cable that is right for the job.

BIG BOOM IN THE VALLEY. U.S. Steel builds its new Fairless Works in rural Bucks County, Penna. To meet the expanding need for power—in new plants and homes—utilities in the area are adding new generating capacity and rushing new transmission and installation lines in the Delaware Valley.

NDUSTRIAL LIGHTING . . .

's important to match ables to today's lighting needs

here are many reasons why today's lighting requirements are greater than in the ast. There is a very definite relationship etween higher intensity of illumination nd greater and more efficient (or lower- verall cost) production. The demand for etter lighting is continually increasing ecause people's ideas change with the ontinuous increase in efficiency of light roduction. You can readily see that oday's industrial lighting, more often than ot, requires fair-sized cable for feeders nd branch circuits. Transformers located t convenient points make long runs less requent and less necessary.

The principal conductors which may be sed in industrial lighting are Types R, RH and RH-RW rubber and TW thermo- lastic. Cables must be selected to satisfy wo requirements: safe ampere load and ermissible voltage drop. The smallest ize—No. 14 Awg—should be used with are. Allowable current ratings, as given n the National Electric Code, are for afety only and may not satisfy voltage- rop requirements at all. This latter point annot be stressed too often.

Good lighting is an important produc- ion tool. But, regardless of the number of nits installed, a lighting system is no etter than the circuits that serve it. Good amp life and illumination efficiency de- pend upon operation at rated voltage— and this is only obtainable with circuit adequacy. And last but certainly not least, the design of the circuit should be made flexible enough to permit additions or alterations in the future. Some recent jobs have been designed and installed so that feeders and branch circuits are good for twice the present illumination.

THIS WORK AREA, 80 x 140 ft., is lighted by 136 fixtures to provide 50 foot-candles. Each fixture has two 75-watt, 96T-12 standard warm white fluorescent lamps.

—photo courtesy of Franklin Products Co.

All-Purpose DURASHEATH Cable is selected by industrial plants to simplify installations

The order of the day is expansion of power facilities. In industry this expansion means new power lines. Where these lines demand different types of cable as they shift from one location to another, time-consuming jointing becomes necessary. Jointing costs money . . . slows down cable installation.

Industrial plants have found a way out of these difficulties. They select DURASHEATH*, Anaconda's neoprene-jacketed power cable. This time-tested cable may be buried, strung overhead, and run in ducts *in one continuous run.* One cable type—not three—is needed.

DURASHEATH is available in all sizes, single or multi-conductor, copper or aluminum, from 600 to 15,000 volts. Use it for power cable in industrial plants, railroads, series or multiple street lighting, traffic control, and airport† lighting, residential primaries and secondaries, and for Type USE cable for underground service entrance.

*Reg. U.S. Pat. Off.

†when ordered to CAA Specifications L-824

SHORTS THAT MAKE SENSE

TAILOR-MADE. Do you know that you can purchase "packaged" power load centers and their components? You will find them easily installed and easily moved. They are well-engineered and basically right for your electrical plant. When you select the right cable to match them, you produce safe operation, prolong cable life and add to your service dependability.

WRONG CABLE. Here's a story with a moral: it pays to choose the right cable. An industrial plant routed a 1-conductor, 500 Mcm rubber and braid (Type R) conductor for a feeder run through 3 buildings, one a boiler house. Result: early failure where it ran through the boiler house. Insulation and braid became brittle, cracked and of no value. Ambient temperature was too high.

SAVE AND IMPROVE. Dry-type transformers have made great strides in their development for lighting. If you locate them at any convenient nearby point, you will save on copper size and at the same time improve voltage regulation.

START RIGHT. Cures cost money; prevention always has a lower price tag. To avoid trouble from electrical inadequacy, install a well-designed, thoroughly engineered system in the beginning. If you inherit an inadequate system, make specific check-ups at once to find the causes; then take proper steps to remedy the situation. Don't wait for real trouble. It never comes at the right time.

SYSTEM PLANNING. It's no joke to be caught with your plant down . . . through failure to anticipate future needs. Look ahead *now* to future needs. Remember that delivery and installation of new equipment take time . . . often up to two years. System planning prepares for potential increase in business.

SINGLE SOURCE. Many cable installations suffer from improper jointing and terminating. Poor design, inadequate materials, wrong methods, or all three are responsible. The cable and its accessories should be considered together. When the combination is furnished by one supplier, the responsibility for correct materials lies with him alone. It also saves time in placing orders.

LIGHTING CIRCUIT POINTERS. Spare lighting capacity is important. Plan carefully for future growth of the lighting system or increased illumination intensities. Consider fixtures to be used. Starting current on some types of units (high intensity mercury vapor) is higher than operating current. Use a minimum of No. 12 wire for all lighting circuits. Keep voltage drop within one percent.

in the years between now and 1956 ..

which conductor shall it be for

America's electric power expansion?

COPPER
or
ALUMINUM

Some will choose copper . . .
some aluminum . . .
some both.

Whatever your final choice—it will alw[ays] pay you to specify ANACONDA . . . becau[se] here is a *single* source of supply for:

copper and aluminum insulated cables
copper and aluminum service cables
copper, aluminum and copperweld bare and weatherproof
copper and ACSR transmission and distribution

Here, in the making of conductor, jack[et], insulation and the entire cable, mod[ern] manufacturing techniques are backed by years of field engineering and construct[ion] experience. Metallurgical and develop[ment] facilities are the most up-to-date.

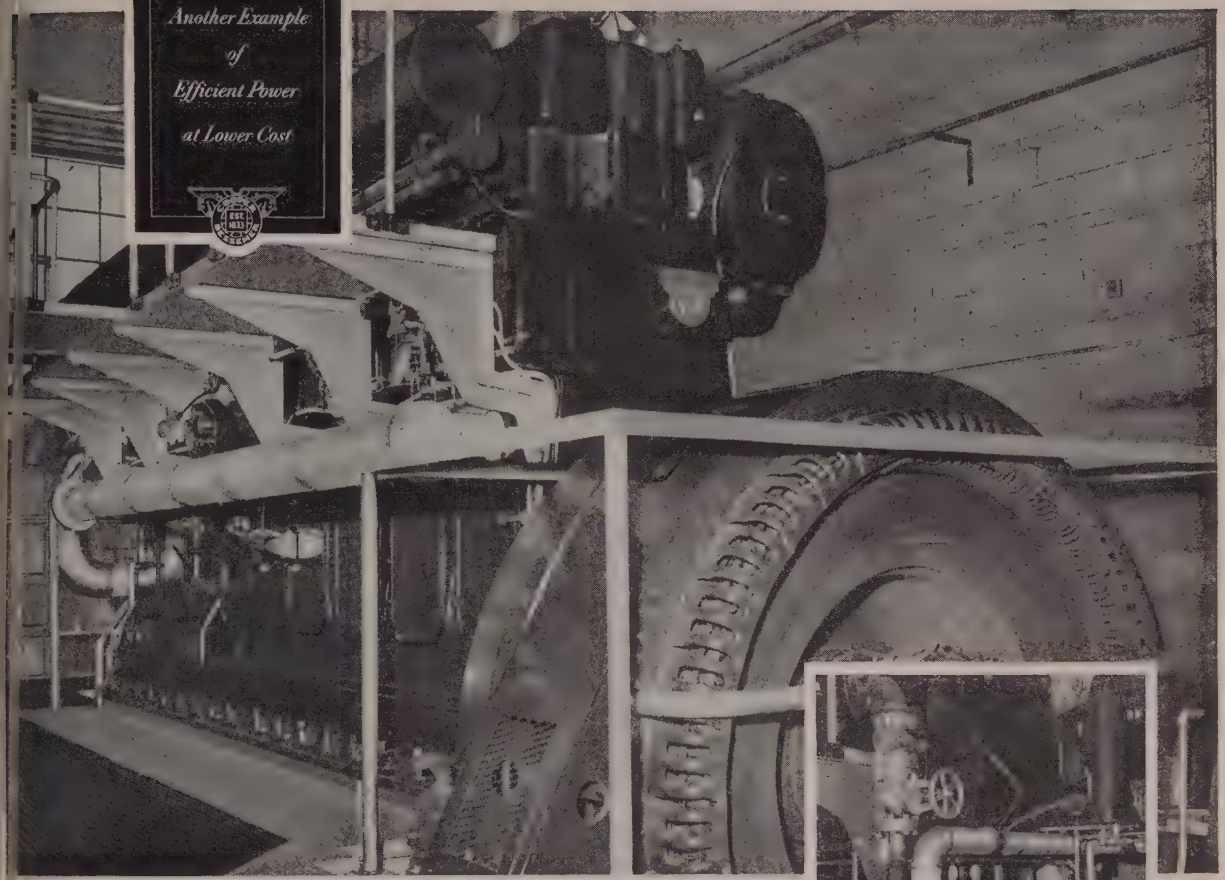
FOR FURTHER INFORMATION about any product mentioned in the pages of this advertisement, see your Anaconda Representative . . . or write to *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

ANACONDA®

TODAY'S HEADQUARTERS FOR WIRE AND CABLE

MAKERS OF building, barn, machine tool, control and communication wire • s[ervice] and overhead distribution cables, bare and weatherproof including ACSR • po[rtable] cords and cables • power and bus-drop cables • mine, bridge, aerial, underg[round], duct, network and submarine cables • parkway, airport and street-lighting [cables] station, apparatus and vertical-riser cables • magnet wire • copper, aluminum [and] copperweld conductors • wire and cable accessories.

Another Example of Efficient Power at Lower Cost



Latest of three Cooper-Bessemer LS–8 diesels in International Latex plant, this supercharged 1700 hp unit provides 40% thermal efficiency. End view at right shows piping setup for jacket water heat recovery contributing to 80% over-all thermal efficiency.

How they stretch dollars at International Latex

Here's a diesel plant that is turning in amazing results—*80% over-all thermal efficiency!* The engine is a Cooper-Bessemer supercharged LS-8, installed in the International Latex plant at Playtex Park, Dover, Delaware.

To start with, this modern LS diesel exceeds 40% thermal efficiency — performance rarely equalled! On top of that, an ingenious jacket water heat recovery system captures for processing use another 40% of the total heat input.

In all there are three Cooper-Bessemer LS-8's in this International Latex plant—the supercharged unit shown above and two previously installed atmospheric LS-8's. Later on these original LS-8's can be easily converted to supercharged operation to boost their output and to match the remarkable efficiency of the new unit.

Whatever your power needs may be, check with Cooper-Bessemer. Find out how much you stand to save by the best to be had in efficiency and long, trouble-free engine life.

The Cooper-Bessemer Corporation

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

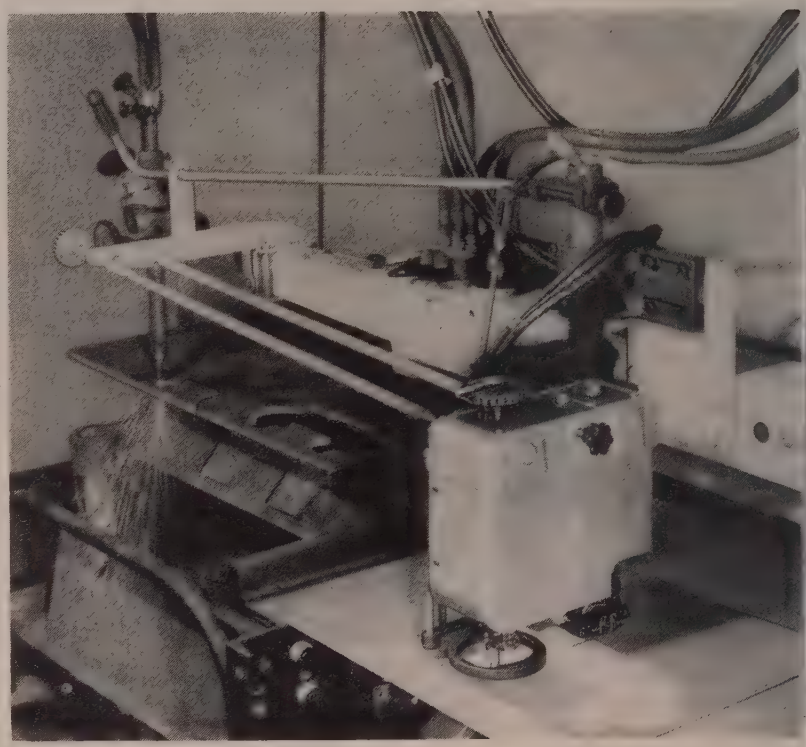
New York Washington, D. C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport St. Louis Los Angeles Chicago Caracas, Venezuela Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Gloucester, Mass. New Orleans, La.

SIMPLIFY Your Shape-Cutting Jobs with the . . .

OXWELD Automatic Tracer

Trade-Mark

- Positive templet contact . . . electronic steering control . . . maximum tracing accuracy
- Templets are easy to make, low-cost
- No kerf allowance required in templet
- Intricate shapes easily reproduced
- Dynamic braking prevents overruns
- Local or remote controls . . simple to operate



With an OXWELD Automatic Tracer to guide your oxygen-cutting machine, you need never forego the advantages of templet tracing because of time or cost. Whatever the shape—whether you need one piece or many—templet requirements are simple. Just draw your templet, full size, on a thin sheet of inexpensive plastic. Then cut it out with scissors or knife. It's that quick and easy. There's no tedious forming. To compensate for kerf width, just set a handy dial on the Tracer.

The OXWELD Automatic Tracer follows practically any templet shape within extremely close tolerances. It can also be used to hand trace directly from blueprints or drawings. Drive action is smooth and steady with both single- and multiple-blowpipe setups.

Your nearest LINDE representative will be glad to help you plan an OXWELD Automatic Tracer installation to fit either your present shape-cutting machine or one of the available OXWELD Shape-Cutting Machines.

WRITE TODAY FOR FREE BOOKLET F-8086

Linde

TRADE-MARK

LINDE AIR PRODUCTS COMPANY

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street New York 17, N. Y.

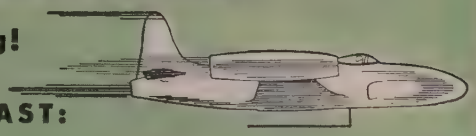
Offices in Other Principal Cities

In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

The terms "Linde" and "Oxweld" are registered trade-marks of Union Carbide and Carbon Corporation.

today, you're hardly aware of any **SPEED LIMIT** *

on surface broaching!



BUT HERE'S WHAT IT'S BEEN IN THE PAST:

6 fpm 1902

25 fpm 1922

60 fpm 1942

today 300 fpm . . . and more!

*Of course we're talking about the new LAPOINTE ELECTRO-MECHANICAL DRIVE horizontal BROACHING MACHINE

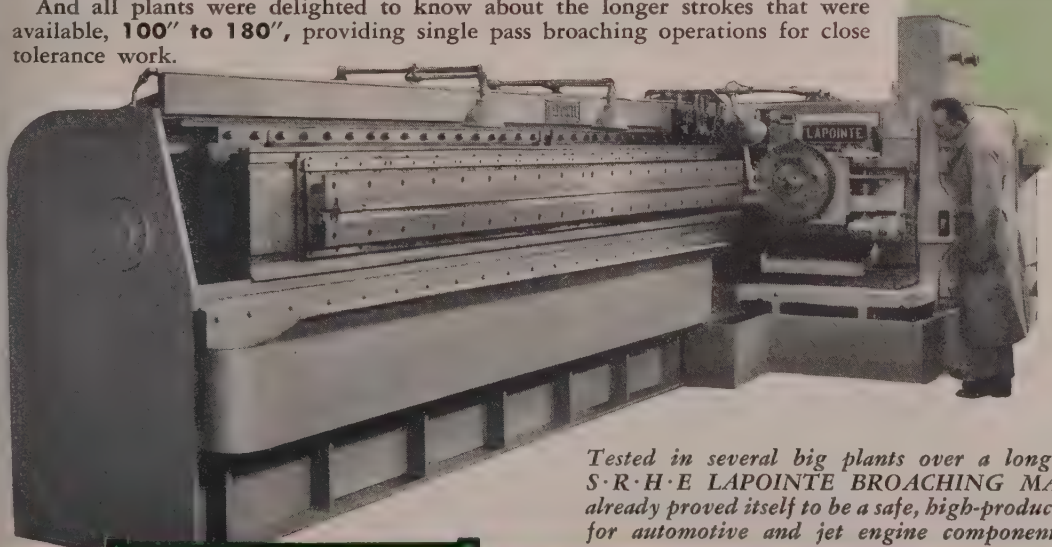
Enthusiastic approval of this new LAPOINTE BROACHING machine has been given by some of the best people — and best plants — in America! How? *They said it with orders!*

These orders came, because some plants wanted the greater flexibility and versatility now available through the Dual Speed and Dual Cycle (patented) features;

Some plants needed the higher production now possible in a modern high-speed broaching machine;

And all plants were delighted to know about the longer strokes that were available, **100" to 180"**, providing single pass broaching operations for close tolerance work.

Write for new Technical Bulletin **SRHE-3**



Tested in several big plants over a long period, the S·R·H·E LAPOINTE BROACHING MACHINE has already proved itself to be a safe, high-production machine for automotive and jet engine components especially.

THE LAPOINTE MACHINE TOOL COMPANY

HUDSON, MASSACHUSETTS • U. S. A.

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THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES

GRIT

REVOLUTIONARY DISCOVERY...

The world-wide demand for our latest abrasive development, GRITCLOTH, has already forced us to increase our production capacity. Right now we are keeping abreast of the still growing clamor for this most advanced sanding material.

GRITCLOTH gives the removed particles a place to go and thereby maintains fast cutting action throughout its amazingly long life.

For machine and hand sanding or polishing . . . wet or dry . . . it's GRITCLOTH. Order now!

TOMORROW'S SANDING FABRIC TODAY!

Innumerable Uses for Metal and Paint Finishing.

Excellent for fast, smooth rubbing of prime coats on all boat and marine finishes. Extra-long life whether you use GRITCLOTH wet or dry.

Outstanding results from leading car manufacturers using GRITCLOTH for wet prime-coat sanding. BOTH SIDES OF GRITCLOTH are used, for maximum life.

New production speeds in all metal fabrication finishing and deburring. Less down-time means more production and less cost with GRITCLOTH.

Non-loading feature gives GRITCLOTH tremendous advantages in speed and amount of material removed. GRITCLOTH saves you money on machine or hand polishing.

CLOTH

OPEN MESH SANDING FABRIC

PATENT APPLIED FOR

"HEARD 'ROUND THE WORLD"!

★ 10 to 15 TIMES LONGER LIFE than the conventional types of coated abrasives.

★ NON-LOADING . . . OPEN MESH LETS THE REMOVED PARTICLES FLOW RIGHT THROUGH.

★ THOUSANDS OF SUPER-SHARP EDGES KEEP ON CUTTING.

★ USE WET OR DRY

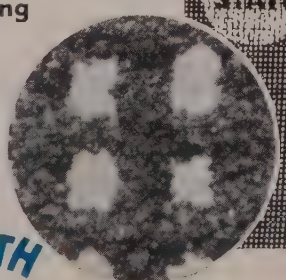
★ FLAT OR FOLDED

★ BY MACHINE OR HAND

★ BOTH SIDES

★ APPLICATIONS ARE LIMITLESS . . . each day finds a new successful operation for this Miracle Modern Sanding Fabric.

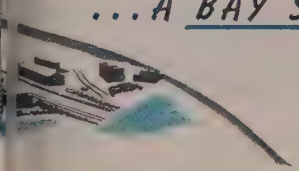
Where can YOU use it?



BAY STATE

GRITCLOTH

...A BAY STATE PIONEERED PRODUCT



BAY STATE ABRASIVE PRODUCTS CO., Westboro, Mass., U. S. A.

Branch Offices and Warehouses — Chicago, Cleveland, Detroit, Pittsburgh
Distributors — All principal cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.

give the GO-signal to DETREX for guaranteed phosphate coating

Detrex has been working with phosphate coatings for rust prevention and better paint adhesion for over twenty years.

Today, Detrex phosphate coatings have gained rapid acceptance by manufacturers of painted products from coast to coast. This acceptance is based on proven advantages . . . exceptional rust protection for metal surfaces, excellent fine-grained crystalline structure that literally locks paint to the metal, and economy and ease of application.

There is another important reason for the growing popularity of Detrex phosphate coatings . . . Detrex One-Stop Service. This exclusive Detrex service places the responsibility for the *complete* process in the hands of one competent company. On present operations, both cleaning and phosphating chemicals are produced by Detrex—on your new applications, Detrex produces the equipment too. In either case, *the results are guaranteed!*

For a more durable paint finish, for economical, easy-to-control processing, for *guaranteed* performance—give the GO-signal to Detrex

for free survey

At no obligation to you, the Detrex field man in your area will come in and survey your present or proposed operations. There is no cost for the service. The result will prove to you the money-saving advantages of Detrex service. Just fill out and mail the coupon below . . . our field man will call you for the most convenient time to come in.

DETREX CORPORATION
DEPT. 301, Box 501
DETROIT 32, MICHIGAN

Please have the Detrex man in our area make an appointment to survey our operations to point up ways of cutting cleaning costs.

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COMPANY
ADDRESS
CITY . . . . . **ZONE** . . . . **STATE**

DETREX CORPORATION

DEGREASERS • DEGREASING SOLVENTS • WASHERS
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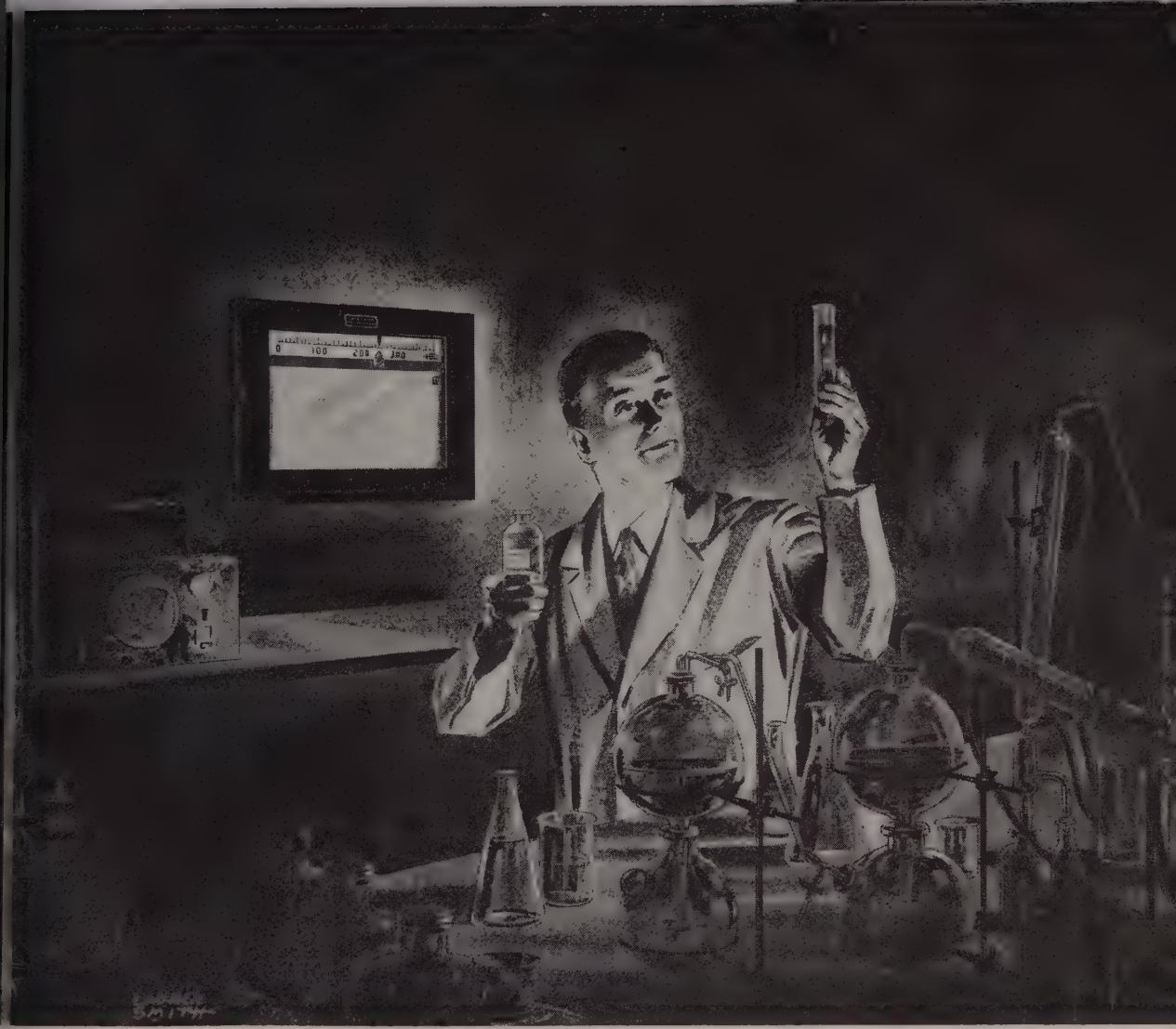
EQUIPMENT • PHOSPHATE COATING PROCESSES



In your research, too—

ElectroniK instruments can save time and effort

SAVINGS of labor and time — through *ElectroniK* instruments— prove as valuable in the research laboratory as in the production plant. In hundreds of industrial and academic research centers, these instruments are assuming the burden of routine work that has long hindered the progress of many a vital project.

By automatically observing tests . . . measuring critical conditions . . . plotting curves . . . regulating test variables . . . *ElectroniK* instruments free scientists for full utilization of their specialized talents. These tireless "lab assistants" work day and night. They make it possible to run many tests continuously . . . accumulating data at a greatly accelerated pace without adding to personnel work-loads. And they achieve greater speed, precision and consistency than could be possible by human hands.

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MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4462 Wayne Avenue, Philadelphia 44, Pa.

● **REFERENCE DATA:** Write for new Bulletin 14-1, "Automatic Instrumentation to Accelerate Research."

MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS
First in Controls

Life Saver for Small Fry

*Another example of how Carpenter *Application Engineering Service is working for industry*

You know how youngsters are on a trip—they love to be near the window to make sure they see everything whizzing by. But that can be dangerous . . . a door can fly open, a tragedy can strike. That's why this safety door lock was invented. Quickly attached, it keeps children in . . . enables them to enjoy the trip, safe and secure. To open the door, the driver simply pulls a release knob. But the production problem wasn't as simple as that.

The material for the lock had to be economical to fabricate, had to provide high strength, corrosion resistance and a bright finish. Cold rolled steel, chrome plated, was tried but it just couldn't make the grade.

Then Carpenter was called in and Application Engineering Service went to work. Results: They used Stainless No. 6 (Type 430), a bright, high-strength easy-working Stainless produced by Carpenter for just such jobs. No. 6 met all the requirements . . . and made the lock a real sales winner.

Here is another example of how Carpenter A.E.S. is working with industry to unearth new ways to make products more functional, more salesworthy, more economical to produce. You can count on this Carpenter service to help bring these advantages to your plant, too. It goes to work as soon as you get in touch with your Carpenter Mill-Branch Warehouse or Distributor. THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

Carpenter STEEL

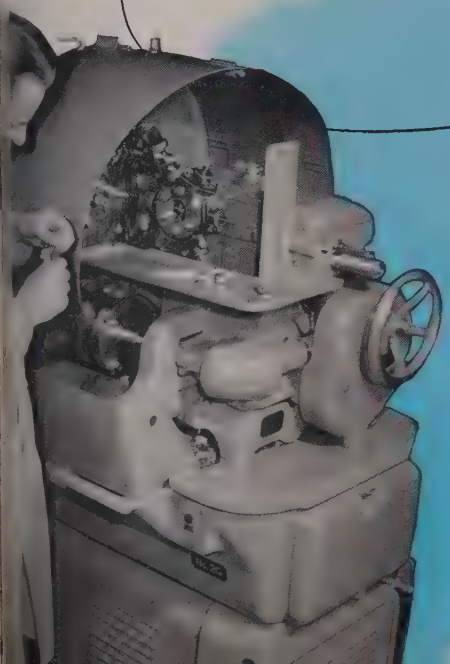
Tool, Alloy and Stainless Steel

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

SCANNED

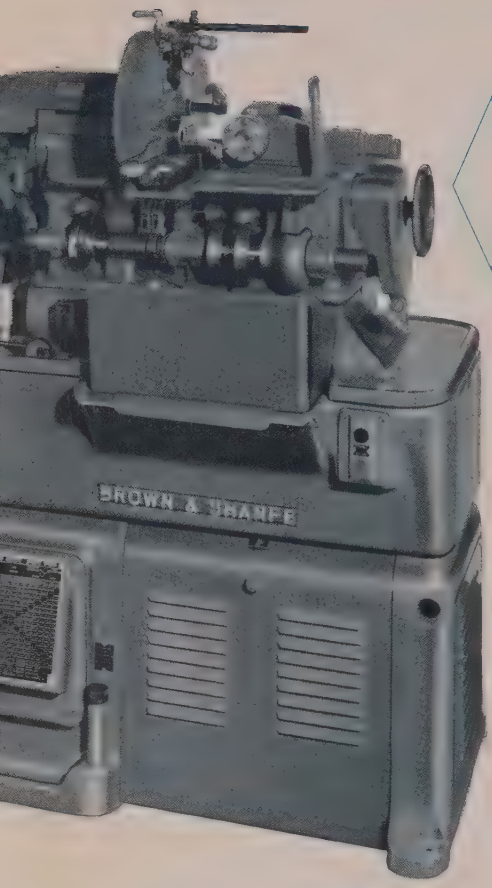
HIGH SPEED

Screw
Machine
Equipment



Brown & Sharpe

"Speed-up" your Screw Machine Departments...

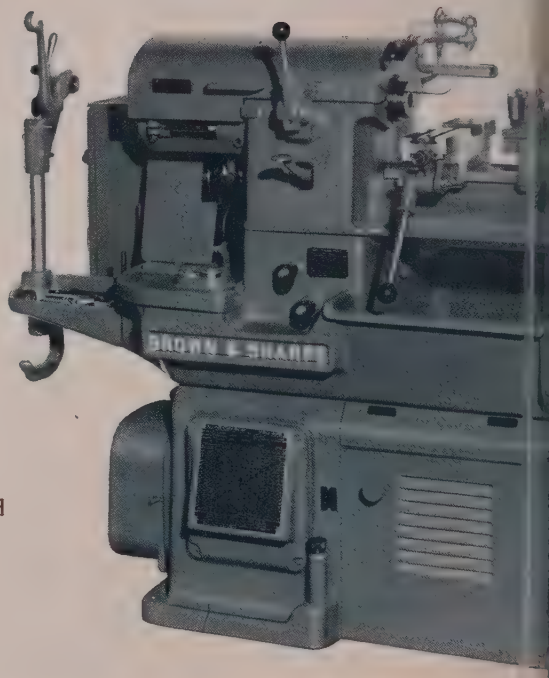


... ON LONG RUNS

BROWN & SHARPE

Automatic Screw Machines
Nos. 00G (illustrated), 0G, 2G
and the new No. 4

Minimum cost per piece on long and moderate runs is assured with these fast-operating Automatic Screw Machines. Rapid non-cutting movements, together with wide range of spindle speeds and speed ratios, "speed-up" each operation . . . permit top cutting efficiency on a broad variety of materials. The three smaller machines are also made in Automatic Cutting-Off types for manufacture of precision parts requiring only forming and cutting-off.



BROWN & SHARPE

Hand Screw Machines
Nos. 00, 0 (illustrated), and 2

... ON SHORT RUNS

Jobs of small or moderate quantities are more quickly handled on these easy-to-set-up Hand Screw Machines. They perform the same operations as automatics, but do not require cams or timing . . . make short runs and second operation work highly profitable. Tooling is economical inasmuch as they use many of the same tools, collets, and fingers as the automatics.

Brown & Sharpe

B·S

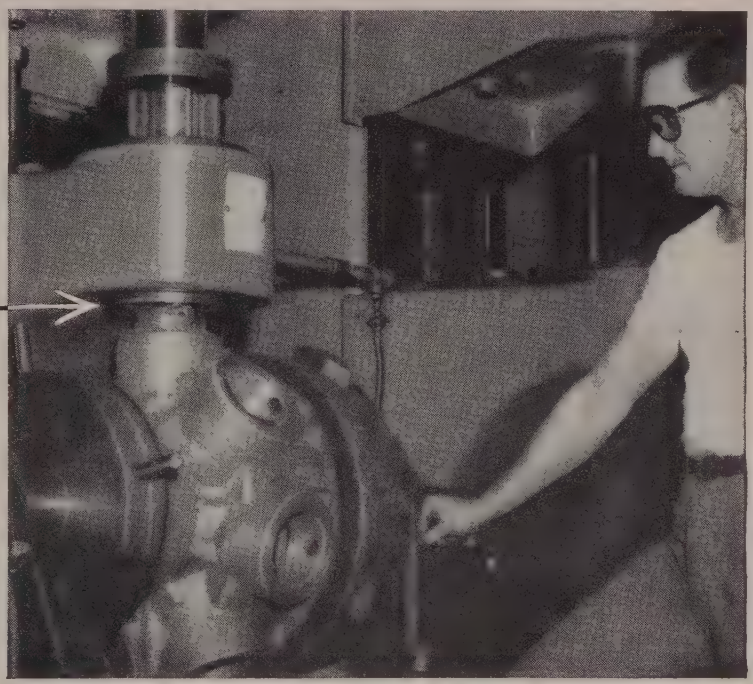
Milling Machines • Grinding Machines • Screw Machines • Cutters • Machine Tool Accessories
Machinists' Tools • Electronic Measuring Equipment • Johansson Gage Blocks • Permanent Magnet Chucks • Pumps

BROWN & SHARPE MFG. CO., PROVIDENCE 1, R. I., U. S. A.

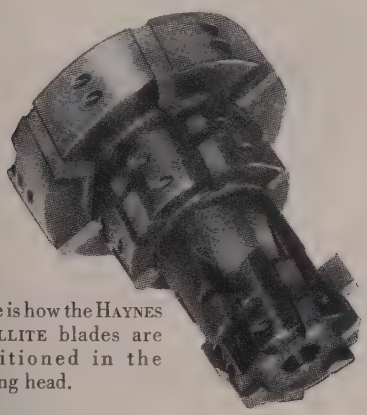
PRINTED IN U.S.A.

2000 Cylinder Ports per Grind

because HAYNES STELLITE *tools resist* CHIPPING and SPALLING



This boring head, containing 20 HAYNES STELLITE inserted blades, operates for 4 to 6 weeks without grinding.



Here is how the HAYNES STELLITE blades are positioned in the boring head.

A multiple blade boring head containing 20 HAYNES STELLITE alloy inserted blades operates from 4 to 6 weeks without regrinding at a plant making refrigeration and air-conditioning equipment. The tools bore, chamfer, counterbore, drill, and face the cylinder ports in cast iron compressor heads. This is all done in one operation.

HAYNES STELLITE blades average over 2000 cylinders per grind even though machining is complicated by an intermittent cut at a gas outlet port in the cylinder wall. The tools are good for 25 regrinds—an average of 50,000 cylinders per cutter.

Tools made of HAYNES' STELLITE alloy resist chipping and spalling—even on tough jobs like this one. This is one reason why the tools are easy to grind and can be reground so many times.

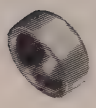
For information on how to use HAYNES STELLITE tools on your machining jobs, write for the booklet "HAYNES STELLITE Metal-Cutting Tools." It gives helpful information on chip formation, tool design and the machinability of metals.

HAYNES TRADE-MARK *alloys*

Haynes Stellite Company
A Division of
Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Indiana
Sales Offices
Chicago — Cleveland — Detroit — Houston
Los Angeles — New York — San Francisco — Tulsa

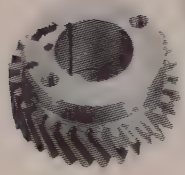
"Haynes" and "Haynes Stellite" are trade-marks of Union Carbide and Carbon Corporation.

☐ High Strength

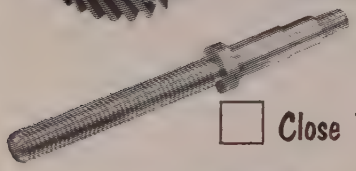


☐ Fine Surface

☐ Toughness



☐ Hardenability



☐ Close Tolerance

☐ Accuracy of Section

WHAT ARE YOUR REQUIREMENTS?

Republic Cold Drawn Alloy Bars deliver all 6 . . . plus

UNIFORM MACHINABILITY

Check the properties your steel parts require . . . add the economy of uniform machinability . . . and you have the answer to production and cost problems . . . Republic Cold Drawn Alloy Steel Bars.

High-speed automatics take full advantage of the cost-cutting qualities of Republic Bars. Designers can make full use of the high strength and uniform structure of these cold drawn bars. Production men can get the ideal combination of wearability and strength out of the uniform hardenability and toughness of the alloy steel.

And . . . Republic 3-Dimension Metallurgical Service focuses the experience of our Field, Mill, and Laboratory metallurgists on your production problems for the best answer with Republic Cold Drawn Alloy Steel Bars.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
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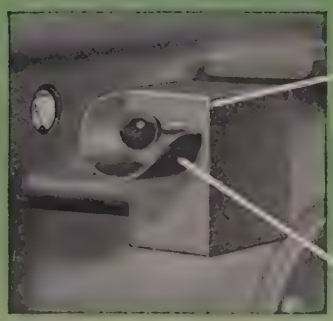
Export Department: Chrysler Building, New York 17, N.Y.

Republic COLD DRAWN REPUBLIC STEEL®
ALLOY STEEL BARS

Outstanding ACCURACY

...and INSTANTANEOUS CONTROL

effect a 30% saving!



The time required to shape 7 separate internal oil grooves in these steel sleeves was reduced from 12.5 minutes to 8. minutes, due to the Cincinnati Electro-Magnetic Clutch and Brake.

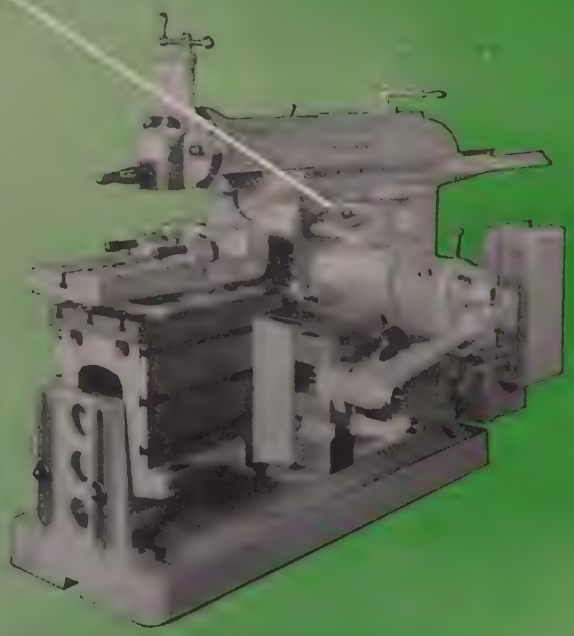
NEW CINCINNATI ELECTRO-MAGNETIC CLUTCH AND BRAKE. . . .

Where starts and stops are numerous they become a serious time waster!

The New Cincinnati Magnetic Clutch and Brake, with its single, convenient control lever, converts waste time into productive time. It gives the operator the fastest, simplest and most accurate control of his Shaper.

This powerful clutch and brake requires no shutdown for adjustment, and has a long, maintenance-free life, both time-saving and profitable features.

Write for Catalog N-5 for the complete line.

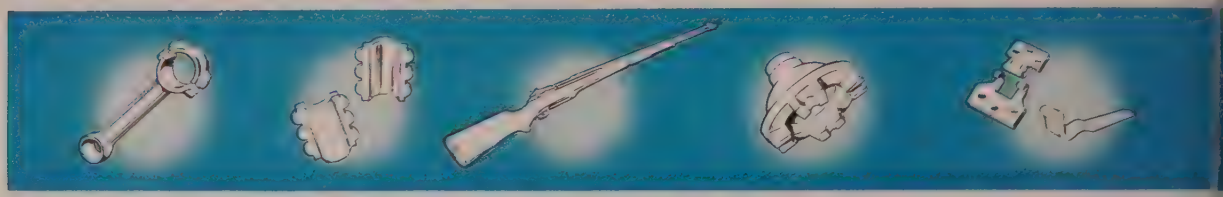


THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

1 The year 1933 marked many automotive design and production advances. Among those on the production front was the first Detroit Broach tooling to broach connecting rods . . . an important advancement in terms of increased production, lower costs and better quality . . .

2 During the later thirties Detroit Broach continued to contribute to automotive broaching advancements. One example in 1938 was Detroit Broach tooling which made possible the complete finishing of main bearing caps cast in one piece in two passes . . .

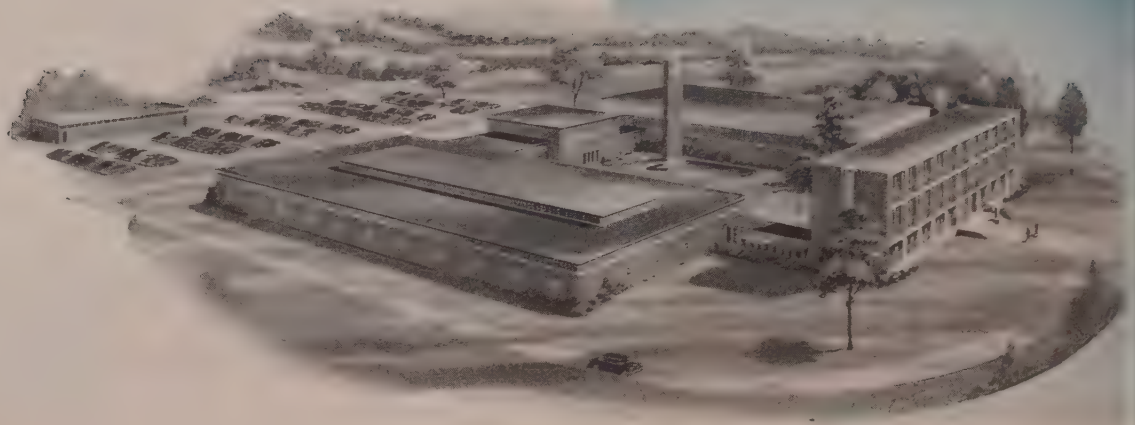


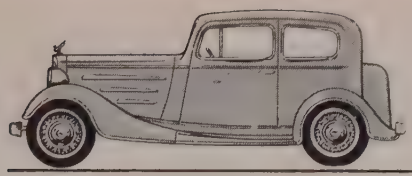
3 In the war years, the auto industry turned to war material and to Detroit Broach for the broach tooling for hundreds of parts. Typical was broach tooling to produce the rifling in gun barrels in a single pass and multiple-surface broaching operations on other gun parts . . .

4 Detroit Broach has continued to serve the auto industry in the post-war years. Tooling to broach differential cases, hinges, automatic transmission parts and innumerable other parts is helping to hold the line on rising production costs.

TODAY, automation has been introduced by Detroit Broach as an integral part of broach tooling. Parts are fed to, and carried away from, automatic broach tooling by specialized conveyor and hopper equipment. Tomorrow, too, one thing is sure . . . Detroit Broach will continue to pace the giant auto industry's need for better, more efficient production machining.

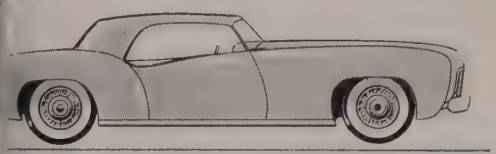
This is a view of the new, ultramodern Detroit Broach plant and offices located in Rochester, Michigan — just outside Detroit. Designed by Sture Frolen, eminent Swedish architect, it embodies many important advancements that contribute to employee morale and manufacturing efficiency. Another example of the unusual facilities of Detroit Broach Company.





Broaching Pioneers

IN THE AUTOMOTIVE INDUSTRY



Master of mass production techniques, producing at a level where pennies per piece mean thousands of dollars per year, the automotive industry was among the first to recognize the economies of broaching.

Early, too, came recognition of Detroit Broach ingenuity and reliability in the design and manufacture of tooling that would pace production requirements. A small sample of that tooling is shown at the left.

in YOUR industry, too you will find many companies who rely on Detroit Broach to meet their needs for tooling that slashes cost-per-piece, boosts output and provides consistent and repetitive top-notch accuracy.

Detroit Broach engineers, Detroit Broach facilities, in fact the entire Detroit Broach team, are all keyed to one specialized skill. That skill is broaching. It is such specialization that has resulted in many of broaching's greatest advancements.

It will pay you, too, to have a talk with the Detroit Broach representative in your area. You will doubtless find many ways to lower the boom on rising production costs on present as well as proposed operations.

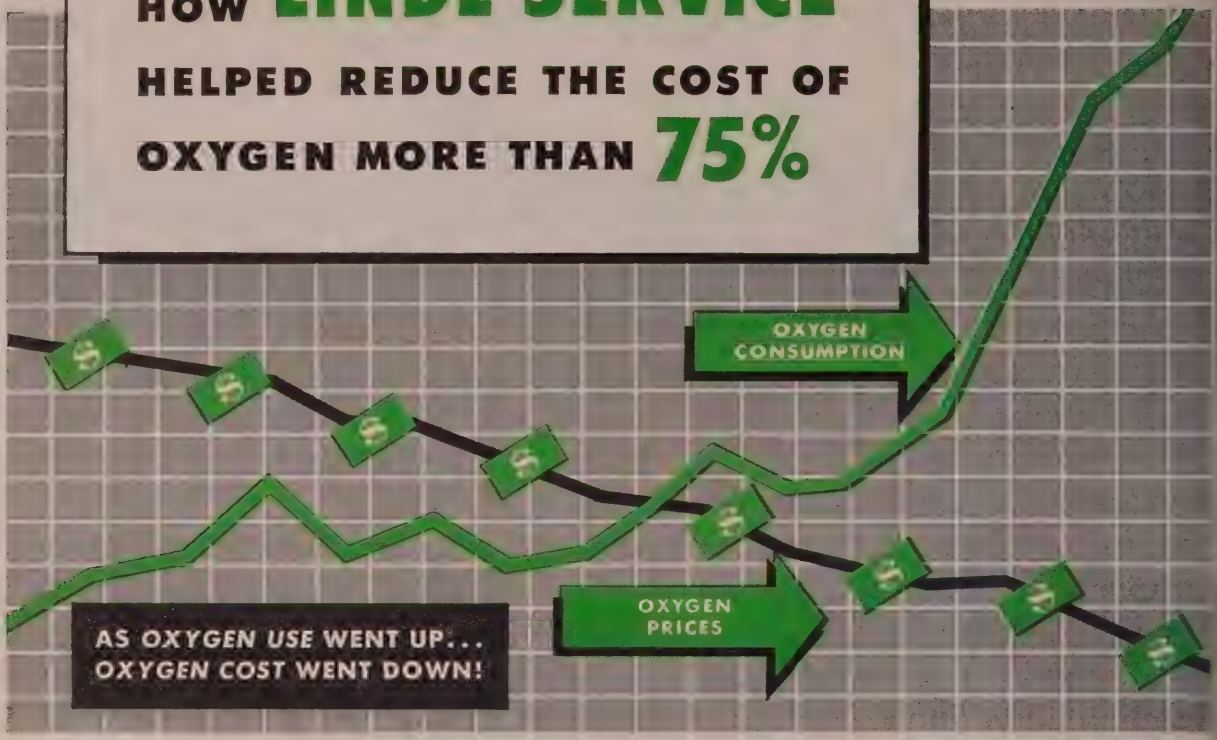
Detroit Broach COMPANY

2174

ROCHESTER, MICHIGAN

Offices in Principal Cities Throughout the World

HOW LINDE SERVICE* HELPED REDUCE THE COST OF OXYGEN MORE THAN 75%



LINDE SERVICE has brought about important improvements in oxygen production, distribution, and methods of use. In profiting by these improvements, LINDE customers have increased their use of oxygen per ingot-ton of steel produced more than 12 times in 25 years. This increased volume of usage in turn enabled LINDE to reduce the cost of oxygen more than 75% in that time.

With LINDE Oxygen you get *all* these important advantages—

- **DEPENDABILITY OF SUPPLY** —— No oxygen shortage due to failure of a single plant. Many strategically located plants to meet every demand.
- **FLEXIBILITY OF SUPPLY** —— No fixed capacities. You get what you need when you need it . . . and pay only for what you use.
- **LOW UTILIZATION COST** —— No capital investment . . . no costly maintenance.

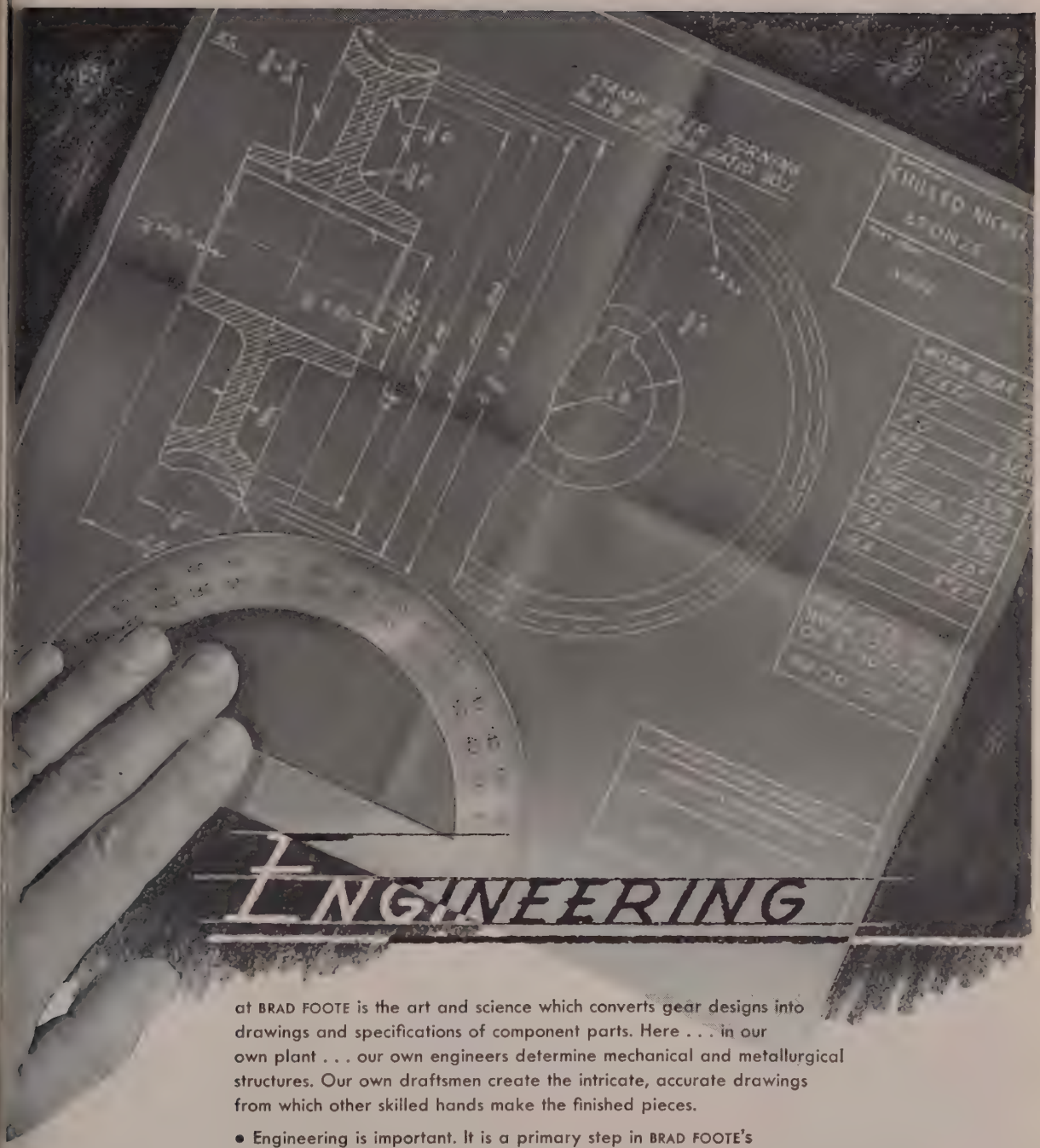
PLUS . . .*LINDE SERVICE—

The unique combination of research, engineering, and over 40 years of accumulated know-how that is helping LINDE customers save money and improve production in their uses of oxygen and oxy-acetylene processes.

If your company uses oxygen, LINDE SERVICE *can mean dollar savings to you. Let us tell you more about it.*

LINDE AIR PRODUCTS COMPANY
A Division of UNION CARBIDE AND CARBON CORPORATION
30 East 42nd Street UCC New York 17, N. Y.
Offices in Principal Cities
In Canada: Dominion Oxygen Company, Limited, Toronto

Linde Trade-Mark



ENGINEERING

at BRAD FOOTE is the art and science which converts gear designs into drawings and specifications of component parts. Here . . . in our own plant . . . our own engineers determine mechanical and metallurgical structures. Our own draftsmen create the intricate, accurate drawings from which other skilled hands make the finished pieces.

• Engineering is important. It is a primary step in BRAD FOOTE's method of complete manufacturing control. It assures you of gears which will perform satisfactorily . . . when used in your shop or on equipment you sell to others.

• This engineering service we give our customers is another reason why we can say—*"No one shares our responsibility."*

BRAD FOOTE GEAR WORKS, INC.

1309 South Cicero Avenue • Cicero 50, Illinois
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AMERICAN GEAR & MFG. CO. • **PITTSBURGH GEAR COMPANY**
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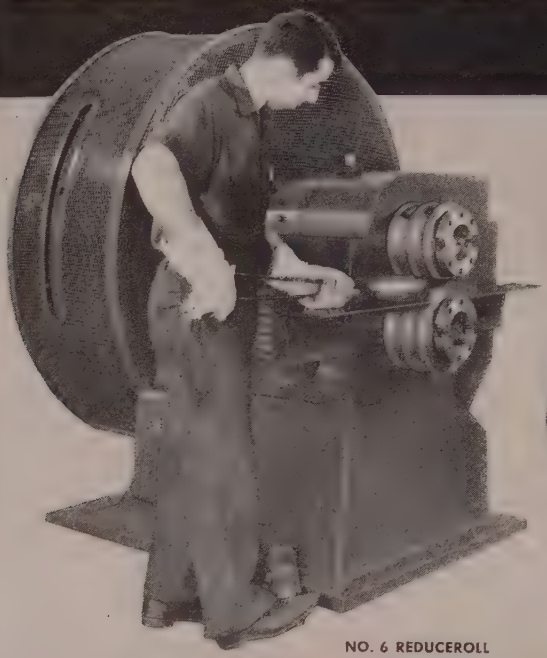
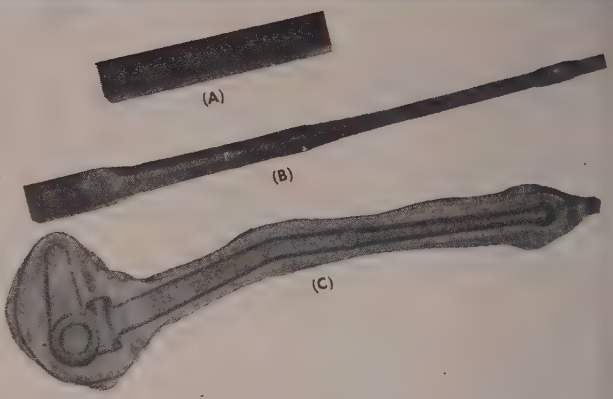
SAVED BY REDUCEROLLING . . .

ONE MAN . . . ONE HEAT . . . ONE POUND of STEEL per FORGING!



NO. 6 REDUCEROLL



At Canada Foundries and Forgings Ltd., Welland, Ontario, the clutch pedal forging illustrated above, was *formerly* forged as follows: Stock was heated and upset in a 3" upsetter, then reheated and finish-forged in a 2500 lb. hammer. These operations required a crew of five men.

Now, by substituting a No. 6 REDUCEROLL for the upsetter, the blank is REDUCEROLLED and finish-forged on the same heat. This method requires only four men, and it saves one pound of steel per forging!

Stock (A) measures 1½ inches square by 9¾ inches long, weighs 6.24 lbs. REDUCEROLLED blank (B) ready for forging. Finished forging (C) forged on the original heat. Note small amount of flash.

REDUCEROLLING gives these advantages:

1. Increases production
2. Does not require skilled labor
3. Increases forging die life
4. Saves expensive material
5. Low-cost, quickly interchangeable rolls

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Since World War I, welding has been our business and today every U. S. jet engine manufacturer is a user of "American Welding" component parts. If your requirements involve either fusion or resistance welding of ferrous or non-ferrous metals, drop a line to our Product Development Division. We can provide complete designing, engineering, metallurgical and machining facilities and will be glad to put our 34 years of welding experience to work on your problem.

THE AMERICAN WELDING & MANUFACTURING COMPANY

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Metalworking Outlook

Used Car Prices: Many Fall

Watch for a general downward price trend for all used cars. But there are some exceptions. Packard Motor Car Co. just completed a study of the situation and finds that there's a stronger demand for some models among higher priced cars selling between $2500 and $4500 than there was a year ago. Depreciation of its two-year-old models is now 9.5 per cent less than it was for two-year-old cars a year ago.

Evolution in Transport

The evolution in city public transportation media still goes on. Trackless trolley busses appear to be following the streetcar into oblivion. "As of today," says E. P. Crenshaw, general coach sales manager for GMC Truck & Coach Division of General Motors Corp., "there have been no orders for trackless trolleys in 1953 and a number of large fleets of trolley busses are being offered for sale." Nor are there any streetcars in production. The motor coach is taking over, although its production is slipping. Some 5375 were built in U.S. factories in 1952, compared with 9460 in 1951. In the first five months of this year, 1192 were built, compared with 2992 in the same period of 1952.

Color TV: Price Is the Thing

The first commercial color TV sets should be on the market in 1954, selling for $800 to $1000. Market experts anticipate sales of only about 50,000 sets the first year at those prices, but demand will rise steadily as the price drops, to about $300 by 1957. When the cost is about 50 per cent higher than black and white sets, look for sales of the older type to become decidedly colorless. So, the replacement TV demand for color sets looks good because about 24.5 million black and white receivers are now in use.

More Home Repairs

Look for continued growth in the construction industry's home repair and modernization work. Its volume has reached about $6 billion annually, half the $12 billion spent yearly on new homes. National Association of Real Estate Boards foresees the time, within the next seven years, when repair volume may equal or even exceed the dollar volume of total new residential building.

End of Nickel Controls?

Pressure mounts to drop controls on nickel and nickel-bearing stainless steel. Canada has already dropped nearly all controls over distribution of primary nickel, electrical resistance alloys and nickel anodes. Last

week the Stainless Steel Industry Advisory Committee made a strong plea for revocation of that portion of Schedule A of Order M-80 relating to nickel-bearing stainless.

New Approach on Pensions

Two new types of pension plans show signs of catching on. Commerce Clearing House reports that a new "Equity Annuity Plan" attempts to pay benefits that fluctuate with the value of the fund's investment in common stocks. Studies of actual market experience indicate that such a plan, in the past, would have approximated changes in the cost of living. The idea is to establish an actuarial fund to pay subsistence-level pensions. Then, supplement those by additional income from annuity units whose value depends upon a second fund's investment experience in securities. The other new type is an "Employees' Option Plan" which gives the employee the privilege of buying extra units of retirement income above that provided by the company's basic pension plan.

Now It's SBA

The new Small Business Administration, authorized by Congress last week, supplants the old Small Defense Plants Administration and will take over Reconstruction Finance Corp. loan activities. The RFC goes out of business June 30, 1954, its functions to be scattered among several agencies, including SBA. A board will rule on loans and will consist of the SBA administrator and the secretaries of Treasury and Commerce.

Aid to Shipbuilders

Congress late last week moved to help shipbuilders. Both Houses were in substantial agreement on a measure to provide for a national defense reserve of tankers and to expedite construction of new tankers. The bill authorizes the U.S. to accept tankers ten years old or more as a credit to be applied on the purchase of new vessels. It also would be authorized to pay the cost of defense features in new vessels.

Straws in the Wind

General Electric Co. is studying the feasibility of expanding its Oakland, Calif., wire and cable plant. . . The name of the Bureau of Internal Revenue is changed to Internal Revenue Service. . . The U.S. imported a record amount of manganese ore containing 969,000 net tons of manganese in 1952. . . GM's Electro-Motive Division at LaGrange, Ill., will cut its production of diesel locomotives from seven and a half to four units a day by Sept. 1.

This Week in Metalworking

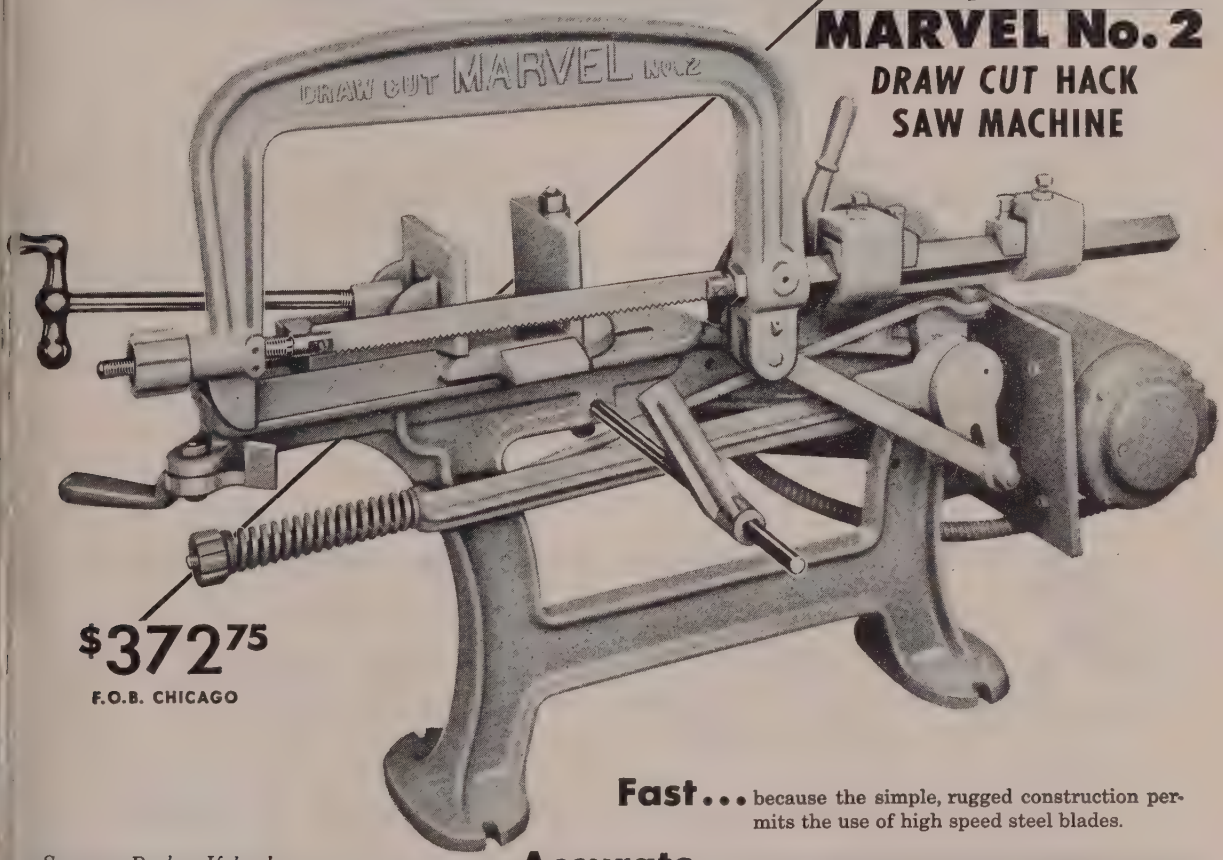
Despite the truce in Korea, military spending for hard goods will rise, not fall in the next 12 months (p. 49). . . Steel companies' second-quarter earnings improved substantially (p. 51). . . Buyers are moving into closer command of their inventories of steel, copper and aluminum products (p. 52). . . A new plastic sheet on the market poses a challenge to metals (p. 54). . . The Kaiser-Willys merger ties are knotted tighter (p. 55). . . More manufacturers' agents are coping with today's metalworking sales problems (p. 56). . . It's smooth going for files (p. 69).

For... General-Purpose Sawing

FAST—ACCURATE—ECONOMICAL—DRY CUTTING

Capacity up to 8" round

Improved
MARVEL No. 2
DRAW CUT HACK SAW MACHINE



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Fast... because the simple, rugged construction permits the use of high speed steel blades.

Accurate... because the improved Saw Frame with clamping type blade holders holds the blade in perfect alignment and proper tension.

Economical... because of its automatic relief on the return stroke, the blade will last and last and last.

Dry Cutting... because modern high speed steel blades will operate efficiently at 60 strokes per minute without a coolant.

See your Dealer. If he does not stock MARVEL Saws, he can get them quickly. Or simply write us for literature and delivery. When buying hack saw blades insist that your dealer furnishes genuine MARVEL High-Speed-Edge Hack Saw Blades—they are unbreakable!

Metal Cutting
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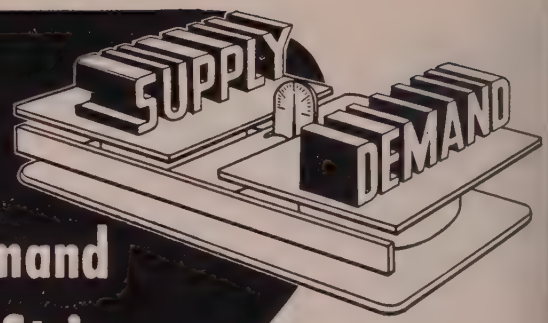
Steel plentiful or scarce . . . Reliance *Job-Fitting* Service helps you balance your demand for Sheet and Strip



There has been much talk about the "coming" supply-demand balance in steel.

Actually, the talk concerns expanded steel-making capacity and the possibility that "one of these days" it may ***over-balance*** demand. Whether it will and when, is anyone's guess.

Meanwhile, this much is sure. No matter what "conditions-in-general" may be, there will always be individual users with ***under-balanced*** supplies of specific items for specific jobs at specific times. . . . And there'll always be your warehouse suppliers to help you correct your own supply-demand balance from day-to-day.

And when it's sheet or strip you need—to get a job started or finished faster or to keep it running—try Reliance.

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Says Dependable Dan about Reliance JOB-FITTING Idea:

- It's knowing our "stuff" . . . our "feel for steel."
- It's knowing your job . . . what you expect the steel to do for you.
- It's supplying in-stock sheet and strip best suited to your immediate need.

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Coils . . . Cut Lengths . . . All Tempers
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COLD ROLLED . . . HOT ROLLED . . . H. R. PICKLED . . . LONG TERNE . . . GALVANIZED
Standard and Production Sizes or Cut to Actual Working Dimensions

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Opportunities in Distribution

In an 8-page discussion in this issue of the problem of distribution as it affects the metalworking industry, the statement is made that some economists agree that our nation seems to need a giant vitamin shot about once every 50 years to keep it prosperous and progressive. They further believe that thus far it has been receiving these shots about on schedule.

In the early 1800s the nation's emergence as a separate and independent political entity fostered rapid economic growth. In the late 1800s it was the opening up of the western lands by the railroads that stimulated economic development. In the early 1900s it was the fabulous development of the automobile that wrought an economic revolution in the United States.

Now we are due for another shot. Will it come from new developments in air transportation, atomic energy, electronics, etc. or could it come from a revolution in distribution? Evidence is mounting to prove that drastic changes in our methods of distribution are overdue and that they could easily have a profound effect upon our economy.

The truth is that the circumstances of war and other emergencies during the past decade or more have served to place great emphasis upon production. At the same time these circumstances have created what has amounted to a moratorium on aggressive sales and distribution activity. The time is at hand when a tremendous effort must be made to bring the efficiency of distribution up to the level of that of production.

This will involve new approaches to many aspects of the distribution problem. It may entail in the handling of the products of the metalworking industry changes as drastic and as revolutionary as those now taking place in the retail distribution of foods and soft goods. In these fields the cost of selling and distributing has been reduced sharply.

In metalworking there has been little incentive up to now to reduce distribution costs similarly. However, the keen competition that will provide that incentive already is knocking at industry's door. New and intelligent attention to sales and distribution will pay big dividends in the months ahead.

E. C. Shaner

EDITOR-IN-CHIEF

TRUCE WAS DISCOUNTED: Signing of the Korean truce came at a time when there were signs of diminishing activity in the metalworking industry. Operations were being reduced in a number of diesel locomotive, agricultural implement and other plants. Would the Korean truce, coming on top of these faint signs of a letdown, affect the metalworking industry adversely?

To get a quick answer, editors of this pub-

lication checked with a score or more of representative manufacturers. Their opinions (p. 49) are even more optimistic than one would expect. All voiced relief at the prospect of returning to civilian markets. They emphasize strongly the fact that only 8 per cent of industrial effort is being devoted to defense today compared to 35 per cent at the peak of World War II. They also point out that government expenditures for defense will not be reduced sharply for another year or more.

These observations jibe with the reaction of the stock market. Truce negotiations dragged out so long that their impact was discounted long in advance of the event.

* * *

WE DON'T KNOW SCORE: The confusion expressed in regard to the Korean truce is understandable. This is the first time the United States became involved in a war that did not end with a clear-cut military victory for us. Our people find it difficult if not impossible to say flatly that the Korean truce means victory or defeat for our side.

In fact, we may have to wait a long, long time before we know the true score of our participation in the Korean mess. Much will depend upon the extent to which we avoid in the future the terrible mistakes we made in regard to the Far East foreign policy in the past. Diplomatic bungling has spoiled much of the fruit of victory of World War II. Our hope for the future lies in a tremendous improvement in our diplomacy.

* * *

NEED TO KNOW MORE: That industry has much to learn about distribution is indicated by the difference in the detail and volume of statistics that are available on distribution and production. We have few figures on the distributive processes (pp. 57-64) compared with those that deal with production. We know the value added by manufacture but we do not know the value added by distribution. We know to a fraction of a cent what it costs to produce 100,000 units compared to 10,000, but it is rare to find anyone who knows what it costs to distribute 100,000 units, compared to 10,000.

We do know that in too many instances the buyer of a product has to pay more for its distribution than for its manufacture. Problems of sales and distribution deserve more attention than they have been receiving.

* * *

AGENCIES SERVE WELL: We know a successful manufacturers' agent who has adopted an almost fatalistic attitude in regard to a prominent manufacturer he has served off and on for decades. The agent has an excellent reputation. He serves dozens of top-rate manufacturers satisfactorily.

The recalcitrant manufacturer gives its sales managers complete freedom on sales policy. Each newly appointed sales manager looks at the manufacturers' agency setup and almost instinctively sets out to prove that the company would do better with its own regional sales offices. The agent is dismissed, the offices are established, they don't work out, they are abandoned and the manufacturer welcomes back his agent with open arms. This process has been repeated so many times that the agent never regards a dismissal as final.

There are more than 5000 manufacturers' agents (p. 56) dealing with metalworking products and most of them are doing a whale of a job.

* * *

SITS PRETTY IN TEXAS: Off and on for many decades enthusiasts have been saying that the Southwest ought to have its own integrated steel mill. Several steelmakers have attempted to provide it, but it has remained for Sheffield Steel Corp., wholly-owned subsidiary of Armco Steel, to be the first to succeed.

Construction was started on Sheffield's project (p. 104) on Houston's deepwater ship canal in 1941. To the original open hearths in time were added facilities which today include a blast furnace, iron ore and coal mines, coke ovens, 8 open-hearth furnaces, an electric furnace, soaking pits, blooming mill, billet mill, and structural, merchant and rod mills and fabricating and finishing facilities for plate and wire products. Ore, coal and limestone come from nearby sources. Much of the market for the mills' output is in nearby points in Texas and Louisiana. The nearest competitive mill is hundreds of miles away. Sheffield at Houston would seem to be sitting pretty.

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That's what you get when you call Ryerson, dependable quality, fast service.

Our stocks of galvanized sheets have been improving for the past several months; so we can now offer you many gauges in a wide range of pattern sizes, as well as in sizes cut to your order. These sheets have a uniform coating, clean and bright, which gives permanence plus a pleasing appearance.

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PREVENT THIS!
Call Ryerson for quick delivery of Inland 4-Way Safety Plate, cut to any shape and size.

PRINCIPAL PRODUCTS: CARBON, ALLOY AND STAINLESS STEELS—BARS STRUCTURALS, PLATES, SHEETS, TUBING, MACHINERY AND TOOLS, ETC.

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what's cooking?

what's cooking?

what's cooking?

what's cooking?

This is the Hot Desk at Inland's central providing office located right in the middle of the open hearth line. It's where Quality Control and Production Control join up. As each heat of steel goes through its open hearth cycle, the Hot Desk gets constant progress reports by phone and telautograph. The metallurgists here re-check customers' orders; see that every heat is made to meet a customer's specifications; start a new heat within 15 minutes if some "spec" is not met precisely.

INLAND

Every hour of the year, Inland steelmakers at the Hot Desk keep us on our toes in serving customers.

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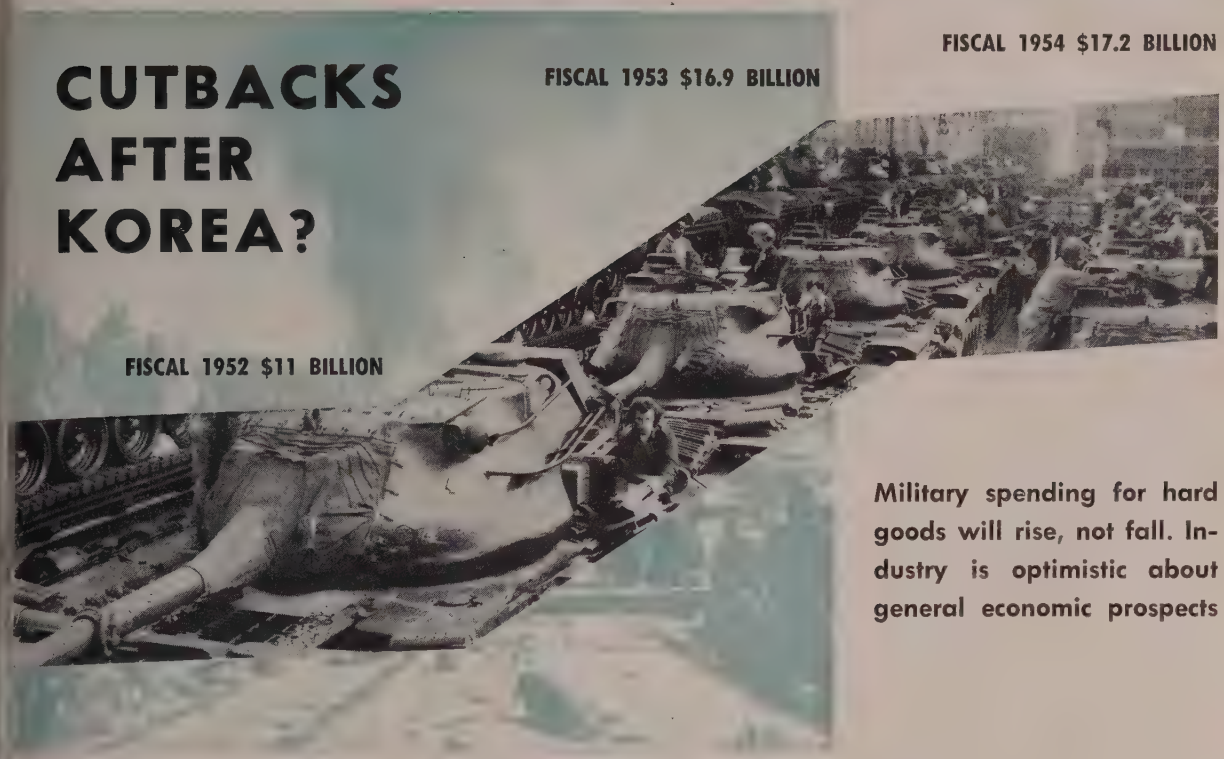
CUTBACKS AFTER KOREA?



Military spending for hard goods will rise, not fall. Industry is optimistic about general economic prospects

THE KOREAN TRUCE will definitely not hurt business and can even be a boon to the nation's economy.

That's the nearly unanimous consensus among more than a score of industrialists and business observers checked by STEEL in a spot survey on the reaction to the armistice. Three major factors underlie their optimism: Military spending will continue high despite the end of hostilities; the high-level economy is getting increasing support from nonmilitary sources; and the much-discussed "psychological letdown" is not materializing.

Up, Not Down—As the above chart indicates, defense spending in fiscal 1954 will rise for aircraft, ships, ammunition, electronics, communications, guided missiles, artillery, vehicles, railroad, construction and materials handling equipment, machine tools and other military hard goods. Even total defense spending in fiscal 1954 will surpass that of fiscal 1953—$43.2 billion compared with $43 billion. It was $39 billion in fiscal 1952.

Total spending by quarters in fiscal 1954 is estimated at $11.4 billion for July-September, $11 billion for October-December, $10.5 billion for January-March and $10.3 billion for April-June.

Keystone — Most industrialists point out that defense production today accounts for only about 8 per cent of all output, compared with 35 per cent at the peak of World War II. Thus, current production of military hard goods has nothing like the effect such output had in World War II. But even though it's relatively small, the military phase of today's industrial operations exerts more influence than the mere 8 per cent would seem to justify. That's because the 8 per cent comes from one source and because it is scattered in virtually every segment of metalworking.

Some adjustments in military contracts undoubtedly will be made during fiscal 1954; that's normal. But those adjustments will not be significant. The big cutbacks—in tanks, vehicles and planes—have already been made. The new joint chiefs of staff are mapping out plans on which spending in fiscal 1955 will be based. Current information is that no substantial dollar reduction from fiscal 1954 is to be expected.

Savings?—Will there be savings as a result of the truce? Yes, and they'll come to about $1.2 billion in fiscal 1954. They will be reflected in ammunition not expended, tanks and other military property not destroyed, fewer soft goods purchases and a saving of some $56 million in combat pay.

But those savings will influence current and future congressional appropriations, but not expenditures in this fiscal year or next. For example, the Defense department just got a $34.4 billion appropriation for fiscal 1954, $1.4 billion less than President Eisenhower expected. Much of that appropriation won't be spent until two or three years from now.

Nonmilitary Support—Then, will a collapse come two or three years from now? None of the industrialists STEEL contacted would predict that far ahead, but many pointed out that these nonmilitary factors to support a high-level economy are strong:

Tool and die makers report that

a decline in defense orders in 19 of the nation's 23 major tooling centers is being counteracted by more civilian work. In the other four centers defense work is holding up very well.

New civilian ordering is one reason why machine tool shipments will hit a record $1.2 billion in 1953, compared with $1,125,900,000 in 1952. Civilian orders will be a big factor in keeping shipments at an estimated $950 million in 1954. Industrial profits are improving slightly despite high taxes (see p.51). STEEL's industrial production index is holding at about 235, only a little below the peak 241 reached late in June (see p. 75). Total capital outlays should hit a record $27 billion this year.

No Letdown—Those indicators, and others, are the reasons why STEEL could find virtually no sign of a psychological letdown as a result of the truce among industrialists it interviewed: Here's a sample of what some of them are saying:

John F. Miller, vice president, Illinois Tool Works, Chicago: "I look for continuing good business under more normal conditions."

Joseph L. Block, president, Inland Steel Co., Chicago: "I do not believe there will be a drastic curtailment because we will see continued high employment and generally satisfactory business."

John C. Sharp, president, Hotpoint Co., Chicago: "The truce can be a boon to our economy because we will be able to operate under more normal conditions."

Fred A. Hansen, vice president, Lindberg Engineering Co., Chicago: "There will be a little hesitation for a while, but this will straighten out. The business our company has booked in the last two months has been surprisingly good and the bulk of it looks like normal civilian orders."

Harlow H. Curtice, president, General Motors Corp., Detroit: "The prosperity of our country is not dependent on war or defense expenditures."

L. L. Colbert, president, Chrysler Corp., Detroit: "The truce in Korea . . . should stimulate our economy in the direction of more and better things for our growing population."

Ernest R. Breech, executive vice president, Ford Motor Co., Dearborn, Mich.: "Only $5 billion yearly has been spent on Korea, while nine times that amount is being spent on defense and foreign aid."

Donald Workman, executive vice president, Gray Iron Founders' Society, Cleveland: "The truce will be a good thing for business in that it will permit us to devote our energies to product development and market expansion."

James W. Moran, president, Baker-Raulang Co., Cleveland: "Industry can counteract any pessimism that may arise—although I haven't seen much yet—by more intense marketing and the introduction of new products to create new markets . . . There are a lot of industries like dairies and bottling works that we haven't had time to give much attention to recently."

A. G. Patterson, president, Electric Controller & Mfg. Co., Cleveland: "In the long run, the truce will be a boon to business."

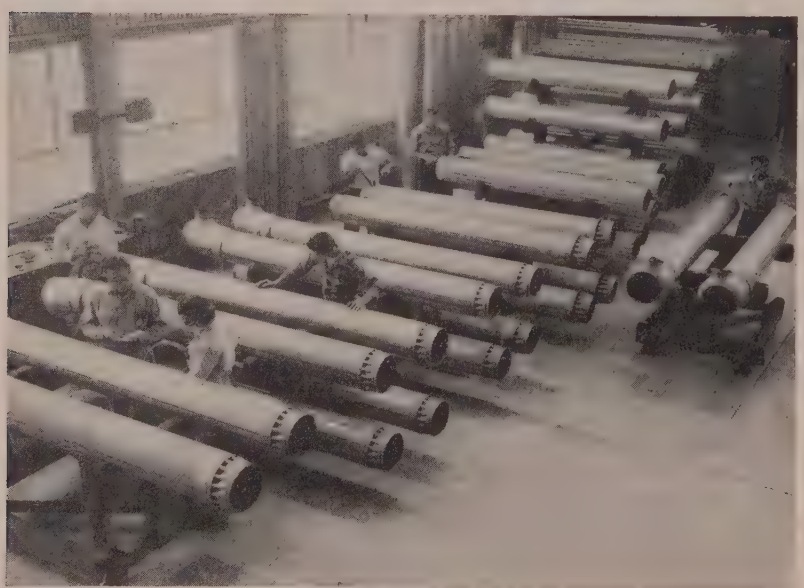
An executive, Westinghouse Electric Corp., Pittsburgh: "Peace in Korea is not expected to materially affect the electrical industry because its production of power producing and consuming goods has always greatly exceeded its production of military hardware and gear."

A steel executive in Pittsburgh: "We welcome the truce because it will let us get even, eventually, with civilian demand."

John T. Whiting, chairman and president, Alan Wood Steel Co., Conshohocken, Pa.: "The Korean truce will have no immediate or direct effect on the steel business. Lower taxes next year will help the economy markedly."

Tom Allen Sr., president, Continental Iron & Steel Co., New York: "The truce has had no effect on the scrap market thus far. If a business reaction does seem likely, much can be done in sales promotion. Foreign trade can be a fertile field."

Government economist, Washington: "Speaking as a private citizen I think that most of the effect of this truce has already been discounted economically because the public has been expecting it so long. So, the impact has already been felt, and the formal signing of the armistice is going to cause scarcely a ripple on business waters."



To Keep Convair 340 Engines Cool

Function of these augmentors being assembled at Rohr Aircraft Corp., Chula Vista, Calif., is to help cool the engines of Convair 340 transports. Hot exhaust gases from the engines pass into augmentors installed through the wing from leading to trailing edge. There the gases are mixed with cool atmospheric air

Renegotiation: Do Conditions Warrant It?

Machinery & Allied Products Institute reflects industry's sentiment when it says no. But Congress is bent on extending the life of the present act to Dec. 31, 1954

THE KOREAN TRUCE should add new impetus to the fight against the extension of the Renegotiation Act of 1951.

Even before the truce, many in metalworking argued that the return of competition in practically all markets makes renegotiation unnecessary. The original purpose of renegotiation no longer exists, executives point out. During World War II when defense production amounted to 35 per cent of total output and when cost was a secondary consideration in an emergency atmosphere of contract pricing, the device of renegotiation probably served some purpose in acting as a check on costs. But now there's orderly pricing and cost is primary in defense output which currently accounts for only about 8 per cent of total production.

Deaf Ear—Despite those arguments, Congress is acting already to extend renegotiation for one year after its scheduled expiration Dec. 31, 1953. The House approved extension July 22, with few changes in the present act. The Senate wants some changes, and late last week the two houses were moving toward a joint conference on the matter. There's only faint hope of blocking extension this session; watch for stronger industry action in 1954.

One of the big leaders in the "let the act die" movement is the Machinery & Allied Products Institute. It claims that the current economic and military picture does not warrant renegotiations; besides, this is not the proper time to consider the extension.

Objections—MAPI's chief objections to the Renegotiation Act are:

1. The process is so inscrutable and excess profits so inexplicable that little incentive is left to pare costs and maximize productivity by manufacturers.

2. The fact that recoveries during World War II were only 1½ per cent lends credence to the hypothesis that losses in lower productivity and inefficient resource allocation may well exceed the gains.

3. Renegotiation also results in lost time by top management and professional personnel in both government and industry.

4. Despite the standards of the act, the determination of what constitutes excessive profits becomes a matter of personal judgment subject to differences of opinion among regional renegotiation boards.

5. By inducing an easy reliance on ex post facto recovery of mistakes, renegotiation can lead to careless procurement — on both sides of the table.

Steel Earnings: Still Strong in Second Quarter

SECOND QUARTER, 1953, may well represent a high water mark for steel industry sales and income for some time to come.

Steel companies report sharp gains from year-ago levels, which were affected by the strike, and in some cases indicate record-making activity. Earnings generally are better than in the first quarter (for first quarter results, see STEEL, May 4, p. 60).

Background—Behind the better sales volume were the continuing high demand for steel products in the first half, plus expanded and improved steelmaking capacity to meet that demand. Tax adjustments made possible by the adverse effects of the prolonged steel strike in 1952 are helping the net income picture for 1953. However, the large sales and income results can be most heavily attributed to more efficient production made possible through new plant and equipment.

The latest wage increases affected only the tail-end of second quarter operations. But those increases, plus the price hikes which they necessitated, may well have an adverse effect on second half business. Partially offsetting the attrition of higher wage costs will be increased production efficiency as modernization plans are rounded out.

Toward Efficiency—A slackening in the feverish pace of steel production, moreover, will allow the mills to drop high-cost, fringe capacity and concentrate production in the more efficient facilities.

Inland Steel Co. reports its sales, production and shipments for the second quarter were the highest in its history and that earnings for the period were higher than any quarter since final quarter, 1951.

U. S. Steel Corp. says income for second quarter, 1953, represented a 5.6 per cent return on sales; for the first six months of 1953 the corporation had a 5.5 per cent return and for first half, 1952, a 4.5 per cent return on sales.

Steel Sales and Earnings Revive

	Net 2nd Quarter Sales		Net 2nd Quarter Income	
	1953	1952	1953	1952
U. S. Steel Corp.	$992,231,313	$596,779,920	$55,640,806	$22,218,922
Bethlehem Steel Corp.	.....	.....	28,534,103	5,378,685
Republic Steel Corp.	309,261,138	167,313,504	14,931,475	4,502,543
Jones & Laughlin Steel Corp.	327,856,000	229,240,000	10,721,000	110,000*
National Steel Corp.	.....	.....	12,989,799	6,774,124
Youngstown Sheet & Tube Co.	142,360,546	81,581,294	7,985,231	1,465,831
Armco Steel Corp.	148,369,350	116,906,407	8,311,488	6,550,752
Inland Steel Co.	153,439,684	95,398,372	8,872,371	4,408,590
Wheeling Steel Corp.	58,504,173	34,337,943	4,093,260	436,311
Sharon Steel Corp.	48,344,721	21,844,733	2,239,141	430,280*
Crucible Steel Co. of America	.....	.....	2,165,641	408,605
Pittsburgh Steel Co.	.....	22,608,055	1,854,792	347,220*
Allegheny Ludlum Steel Corp.	65,632,845	36,510,238	2,163,275	889,425
Granite City Steel Co.	22,368,146	15,651,946	1,848,123	324,690
Detroit Steel Corp.	28,070,600	15,645,671	1,807,318	533,447
Alan Wood Steel Co.	16,859,759	14,887,404	879,971	374,521
Acme Steel Co.	20,037,192	11,272,365	1,244,690	385,485

* Loss

Steel Price Index Revised

The finished steel price index of the U. S. Bureau of Labor Statistics has been revised to make it even more sensitive and representative than it was.

The index is one of the features of the market price section of STEEL each week. Until last summer the index was on a monthly basis but at the request of STEEL the index was made available on a weekly basis as well. STEEL was the first publication to report the weekly figure.

Present revision to improve the index expands the bureau's coverage both in products and companies and includes additional typical extras and deductions applicable to base prices. Formerly, the index was based on 28 finished steel products. Now it is based on 43.

In presenting the improved index, the BLS revised its weekly and monthly index figures back into April. Revised monthly indexes on finished steel are: April, 130.7 per cent (1947-1949=100); May, 134.2; and June, 136.3. Revised weekly indexes are: Apr. 21, 131.1; Apr. 28, 131.7; May 5, 133.6; May 12, 134.2; May 19, 135.8; May 26, 136.2; June 2, 136.3; June 9, 136.3; June 16, 136.3; June 23, 141.0; June 30, 141.2; and July 7, 141.6.

Indexes for the weeks after July 7 are: July 14, 141.7; July 21, 141.7; and July 28, 141.7.

New Lab for U. S. Steel

Groundbreaking ceremonies at Monroeville, Pa., near Pittsburgh, officially started construction of U. S. Steel Corp.'s multimillion dollar central research and development laboratory. Three new buildings will provide floor space of about 132,000 square feet and will replace facilities scattered in six buildings in the Pittsburgh district.

Experimental equipment to be located at the new center will include apparatus for studying all phases of the making, shaping and processing of iron and steel. The contractors, Navarro Corp., Pittsburgh, expect to complete the buildings by the end of next year. Research and clerical staffs at Monroeville will number about 350 employees.

Buyers' Control of Steel Stocks Nears

The general inventory-delivery improvement noted three months ago continues in most steel, copper and aluminum products. Gains will keep coming in the next 90 days

IMPROVEMENT in the inventory-delivery picture for metal supplies in the last three months has been gradual, but consistent.

The ideal inventory position for respondents to STEEL's quarterly survey is 30-60 days for most products, the same as it was last quarter. A glance at the table opposite indicates the actual stocks average about that, except for cold-rolled and galvanized sheets.

Shift — Although purchasing agents now want steel, copper and aluminum for 30-60 day operations, about two-thirds of them indicate a desire for smaller inventories within three months. That's an indication of growing control over stocks. Some 84 per cent of the respondents, the greatest proportion since the quarterly survey began last September, say that they now try to keep inventories in balance with their anticipated sales volumes.

About 83 per cent of the respondents expect more improvement in deliveries, although they're now getting faster shipments on most products than three months ago. The greatest delivery improvement is shown by hot-rolled alloy bars.

Rising Inventories—Because of the faster deliveries and the general improvement in supply-demand balance for nearly all products, inventories are a little larger than a quarter ago, except for welded and seamless tubing and aluminum products. Oil-country demands largely account for the smaller stocks of tubing. Even so, deliveries are faster. The reduction in aluminum inventories is partly accounted for by user caution just before and during the recent price adjustments.

Slower deliveries are cited for hot and cold-rolled sheets and structural shapes. The heavy auto demand results in the stringency for sheets. The peak seasonal demand by the construction industry is the reason for the lag in shapes' deliveries. The situation is not too serious, however. Inventories for all three of these products have increased.

Official View—U. S. Steel Corp. chairman, Ben Fairless, summa-

Latest Metal Supply Picture as Seen by STEEL's Quarterly Survey

(Figures are percentages of those replying to the questionnaire)

COMPONENTS	INVENTORY POSITION					BEST DELIVERY				
	Under 10 Days	10-30 Days	30-60 Days	60-90 Days	90-180 Days	Under 10 Days	10-30 Days	30-60 Days	60-90 Days	90-180 Days
H. F. bars, over 1" (This quarter)	..	31	37	21	11	23	18	35	12	12
(Last quarter)	..	30	65	5	..	6	25	32	19	18
H. F. bars, under 1"	..	23	59	12	6	14	43	14	29	..
	..	22	72	6	..	13	33	34	14	6
H. R. alloy bars	..	8	38	46	8	16	25	17	17	25
	6	14	47	33	..	..	20	37	29	14
H. R. carbon bars, over 1"	3	30	33	24	10	20	32	8	16	24
	..	31	39	28	2	7	34	16	29	14
H. R. carbon bars, under 1"	3	19	45	26	7	17	40	10	20	13
	..	31	49	17	3	16	32	12	25	15
H. R. sheets, strip	4	21	50	17	8	8	19	11	31	31
	3	38	46	7	6	4	30	14	17	35
C. R. sheets, strip	..	32	42	26	..	12	12	6	29	41
	5	16	68	11	..	5	11	26	25	33
Galvanized sheets	..	11	45	33	11	12	13	..	38	37
	17	33	25	25	..	18	9	10	44	19
Plates, light	..	35	39	13	13	9	30	30	9	22
	..	34	53	10	3	16	8	17	37	22
Plates, heavy	..	22	61	11	6	11	17	33	6	33
	..	39	52	9	..	12	5	29	34	20
Structural shapes	5	40	30	20	5	10	10	30	20	30
	..	36	50	14	..	4	29	30	22	15
Welded tubing	..	30	50	..	20	27	18	46	9	..
	7	14	46	20	13	8	25	41	17	9
Seamless tubing	..	43	36	7	14	13	33	27	20	7
	7	9	51	25	8	..	19	72	..	9
Stainless sheets, strip	12	13	50	..	25	10	30	10	20	30
	12	13	38	37	..	..	24	..	26	50
Pig iron (foundry)	..	12	63	25	..	11	67	11	11	..
	11	..	67	22	..	12	75	13	..	..
Copper, brass mill prod.	..	31	46	8	15	18	18	37	18	9
	10	20	50	20	..	20	30	40	10	..
Aluminum products	13	13	47	20	7	15	31	15	39	..
	10	..	72	18	..	..	36	27	19	18

up the inventory-delivery situation this way last week, following the corporation's quarterly meeting: While steel business is still good, indications are that the peak of demand on the present movement has about been reached. Conversion arrangements are fewer, supply has caught up with demand on some products and consumer inventories generally are in much improved position. The same can be said about aluminum, copper and brass.

Metal Allotments Given

Office of Defense Mobilization states that fourth quarter allotments of 1,837,803 tons of steel, 217,497,000 pounds of copper, and 203,595,000 pounds of aluminum cover only "A" products for direct defense needs.

Metal requirements for "B" products carried on the official Class B Product List of the National Production Authority, Department of Commerce, are not included in the allotments announced for third and fourth quarters of 1953, ODM says.

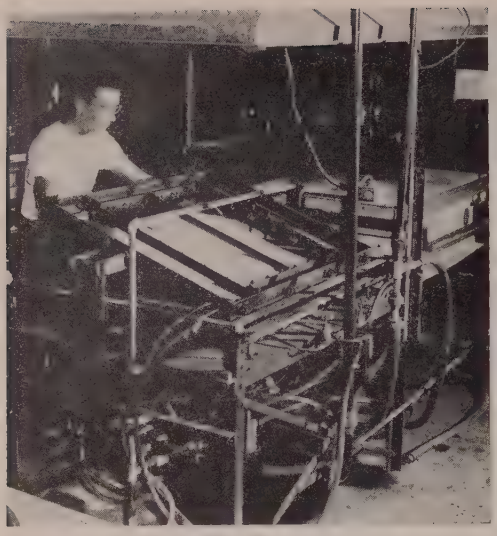
Total set-asides at mill level for the three metals covering both "A" and "B" products are therefore higher than the announced allotments for "A" products in order to accommodate the additional "B" product requirements.

End-use nickel bearing steel is still under control.

Alan Wood To Build New Mill

Alan Wood Steel Co., Conshohocken, Pa., will soon start construction of a $6 million, 4-stand tandem cold strip mill at Ivy Rock, Pa. United Engineers & Constructors Inc., Philadelphia, will construct the new mill, which is scheduled for completion in the first quarter of 1955. It will have an initial estimated capacity of 120,000 tons and will be adjacent to the company's hot strip mill, which went into operation in 1950.

John T. Whiting, chairman and president of Alan Wood, says the construction of the new mill will be financed from internal sources.



Clamping Sheet for Vacuum Forming

Campco Sheet Products

New Plastic Sheet: Challenge to Metals

THE PLASTICS INDUSTRY is widening its range of application as reliable new materials and production processes evolve, providing new opportunities for plastic machinery makers and a challenge to sheet metal.

One such development is a promising new sheet plastic announced in New York last week by Chicago Molded Products Corp.'s Campco Division. An "alloy" of polystyrene and rubber (8 to 10 per cent) continuous-extruded in a single operation, it features high gloss finish and good impact strength without sacrifice of formability.

Advantages—Particularly adaptable for applications where a thin section is desired, Campco S-300 could give a big lift to the comparatively new vacuum forming process. In vacuum forming, sheet is heated and snapped into shape by applying vacuum through a low-cost wooden, reinforced plaster or sprayed metal die. Low die and machine investment allow competition in many areas with injection molded plastic shapes. Design changes can be made easily, and undercuts that can't be obtained in closed molds are possible through special die design.

Low cost of the lightweight rigid sheet plastic stems from getting the high gloss finish in one operation. To get comparable gloss on rigid vinyl requires a second operation which boosts sheet cost 25 to 50 per cent, say Campco officials. Tensile strength of the new sheet is 4000-5000 psi and elongations 22-30 per cent.

Uses—Applications cited by Edward F. Bachner, Jr., Chicago Molded vice president, include refrigerator panels; air conditioner housings and components; auto seat backs, interior door panels, scuff boards and instrument panels; business machine, radio and TV housings and components; containers and packaging; furniture; toys and signs; newspaper mats and printing plates.

Material will be produced at Campco's new plant in Chicago, equipped to produce 500,000 pounds of the sheet per month, in widths from 26 to 58 inches and thicknesses from 0.005 to 0.125-in. Plans are being studied to warehouse standard sizes and colors of the sheet throughout the country, much as steel, aluminum and brass sheets are warehoused. This possibility alone testifies to the growth potential ahead for the industry that has made such giant strides in recent years.

ODM Grants 177 Tax Certificates

Office of Defense Mobilization issued 177 certificates of necessity for accelerated tax amortization from July 2 to 15. The certificates are for new or expanded facilities amounting to $209,644,234.

Four firms in the metalworking industry received certificates for expansion of $3 million or more.

Acme Steel Co., Chicago, received a certificate for $6.3 million expansion in semi-finished steel with 65 per cent accelerated amortization allowed; Bethlehem Steel Co., Sparrows Pt., Md., got one for $3.3 million for miscellaneous expansion with 65 per cent allowed; United Aircraft Corp., Pratt & Whitney Div., East Hartford, Conn., has a certificate for $3.3 million for aircraft engines with 65 per cent allowed; and Easy Washing Machine Corp., Syracuse, N. Y., got one for $3 million in ordnance with a 40 per cent allowance.

Three largest certificates went to the Triangle Pipeline Co., Shreveport, La., for $24.5 million expansion in petroleum products pipe line and storage, 40 per cent allowed on $4.9 million and 25 per cent on $19.5 million; Baltimore Port & Terminal Corp., Baltimore, for $12 million for marine facilities with 50 per cent allowance; and Ohio Power Co., Philo and Canton, O., for $10.9 million for electric power, 35 per cent allowed.

Total certificates granted to July 15 by the ODM amount to $27,493,474,000 for 17,601 new or expanded facilities.

More Exploration Aid Granted

Forty-six new exploration contracts were signed by the Defense Minerals Exploration Administration in the quarter ending June 30, says Interior Secretary Douglas McKay.

This brings the total contracts signed to 517 under the defense program to discover and bring into production critical and strategic minerals. The estimated total project cost of the contracts is $25 million, with the government footing the bill for over $15 million and operators paying the balance.

In the last quarter, 19 certifications were also made. Certification is made when the exploration project has resulted in ore discovery or development in sufficient quantity for possible commercial production within 10 years.

As of June 30, 1953, DMEA had

ued 52 certifications for projects 19 states: 16 were for lead-zinc, tungsten, 7 mica, 5 beryl-mica, lead-zinc-copper, 2 each for cop-r, fluorspar, and manganese, and each in antimony, monazite, ru-e, sulphur, talc, and uranium.

ineral Purchases Extended

The government's program for rchasing strategic and critical aterials in the United States has en extended by Congress through ne 30, 1958.

Purchase points and total de-very to date for each mineral re:

Tungsten is accepted at various illing points, mainly in the West. elivered to date are 283,495 short n units (20 pounds each).

Manganese is accepted at Butte nd Philipsburg, Mont.; Deming, . Mex.; and Wenden, Ariz.; and carload lots at any rail point. elivered are 2,201,500 long ton nits.

Chrome is accepted at Grants ass, Ore. Delivered are 31,064 ong tons.

Mica is accepted at Spruce Pine, N. C.; Custer, S. Dak.; and Frank-in, N. H. Nonruby mica as well as ruby mica will be accepted. elivered are 127,448 pounds block, 22,187 pounds hand-cobbed, and 34 pounds film.

Beryl is accepted at Franklin, N. H.; Custer, S. Dak.; and Spruce Pine, N. C. Delivered are 66 short tons.

Asbestos is taken at Globe, Ariz., in crude Nos. 1, 2, and 3. Total delivered to date is about 171 tons.

Columbium-Tantalum is accept-ed in small lots at Custer, S. Dak.; Franklin, N. H.; and Spruce Pine, N. C. Delivered to date are 1163 pounds.

Willys Goes Into Television

Willys Motors Inc., subsidiary of Kaiser Motors Inc., will go into the television transmitter business when its electronics division starts production on complete TV pack-ages. These are slated for stations operating in areas where high-powered television signals are not received, and will help speed the country's blanketing by local TV stations authorized by the Federal Communications Commission.

Roofing—Easy as Rolling Off a Reel

Roliton of America Inc., Phoenix, Ariz., expects that its portable pan and batten forming machine will open a big potential market in aluminum roofing. The new technique eliminates shop work by feeding aluminum strip directly through the forming machine to the roof. Another advantage claimed by Roliton is a type of construction which allows the roof to breathe, preventing rot and mildew

Kaiser, Willys Tie the Knot Tighter

KAISER MOTORS CORP. and its subsidiary, Willys Motors Inc., will introduce models for price ranges in which are sold 94 per cent of U. S. autos. The new fourth largest automaker hopes initially to account for 4 per cent of the industry's total output.

As consolidation progresses, it becomes clear that the new setup will be in strong contention for consumers' dollars. Combined Willys-Kaiser dealerships will be established within the next four months. The result: More than 3000 dealers will handle the full line of Willys-Kaiser products. Already consolidated are accounting and treasury functions. Purchasing is almost consolidated, and the export operations are moving to consolidation shortly.

Marriage Benefits—Commenting on the advantages of the merger, Kaiser President Edgar Kaiser says, "We now find that with our consolidation overhead for the whole organization is running less than the overhead often ran at Willow Run alone."

Mr. Kaiser also said that the firm is ready to concentrate on cars and that if the Willow Run plant is reopened, there will be more automotive employees there than ever before. The factor on which the reopening of the Michigan plant hinges is union contract negotiations now under way. These involve the classification of personnel and must yield a contract "compatible with the type of work we do at Willow Run" rather than patterned on the other automaker contracts as in the past, says Mr. Kaiser. He feels that such negotiations should be concluded within the next 30 days. They were begun even before the Air Force contract cancellations.

The Spot—The big Willow Run plant, says Mr. Kaiser, is really the place to make cars. If present plans materialize, it will be put to work building steering gear, bodies, transmissions, rear ends and assembling Kaiser and Willys vehicles. The Henry J series may be moved to Toledo. If the Willow Run labor negotiations fall through and the plant can't be reopened, it's reasonable to expect that the firm's products will be built in other outlying Kaiser plants.

Sales Reps: Increased Activity Ahead

'Everybody loves a manufacturers' agent when times are tough,' the saying goes. Right now manufacturers are beginning to look with renewed interest at the reps

"AS BUSINESS TIGHTENS UP, there's always an upsurge in the use of manufacturers' agents. Right now spotty business conditions are encouraging use of reps in some lines but not in others."

That's the analysis of H. L. Lowry, Cleveland manufacturer's representative and past officer in the local chapter of Manufacturers' Agents National Association. More than 5000 manufacturers' representatives of a total 40,000 in the country deal with metalworking products. And that 5000 means manufacturers' agent "firms" which may employ from 2 to 20 salesmen each.

Unusually Active—Reps handle much of metalworking's exploratory sales and new product lines. As new business pioneers who don't eat if they don't sell, they're sensitive to tightening business conditions. So it's not unusual that reps themselves are shifting lines to get principals who are willing to meet present competitive conditions.

For example, L. H. Gardner, president, Airmatic Valve Inc., Cleveland, reports a lot of reps have been seeking new lines in the past two months in the valve industry "because the customer wants it now and we have to be able to give it to him now or he'll go elsewhere." One well-known agent took on the Airmatic line on the West Coast because the company promised to carry an inventory for him there on consignment.

Know and Be Known—Why do manufacturers turn to reps? For one thing, use of manufacturers' agents puts a top limit on field selling expenses. If a manufacturer operates 12 branch offices at a cost of $20,000 apiece annually, that $240,000 may represent 5 per cent of his sales in good times. But in competitive times that figure may grow to 10 per cent, or 15 or 20 per cent of his sales volume. With a rep, the selling cost is whatever percentage is agreed upon, usually 5 per cent.

More important, the representative offers his knowledge of a local market and his reputation in that market. One midwestern firm says: "Our New York rep doesn't know our line as well as we do, can't possibly give our story as completely as we could. But when he walks into an office there, he's greeted with 'If you're selling it, John, it must be good. We'll take some.' That's why we hired him."

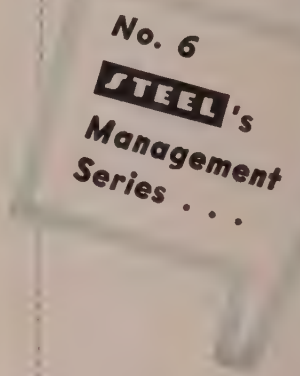
Good Men Available—Electronics typifies the key function of manufacturers' agents in breaking ground in new sales fields (for more on the agents' place in distribution see p. 62). Brush Electronics Co., Cleveland, markets its electronic instrumentation line almost entirely through agents, "and it's a very satisfactory arrangement, too," says Thorpe Thompson of Brush. During World War II Brush began building an organization of agents which completely covered the country by 1949. Today, a good rep selling electronics equipment isn't too hard to find among the 175 to 200 firms carrying such lines, and most manufacturers use them.

When times are tough, when there's a new line to be tested, when selling expenses would limit the marketing by the manufacturers, sales agents come into their own. They did nearly $4 billion in sales last year; should hit the $4 billion mark in 1953.

Employment Rises in South

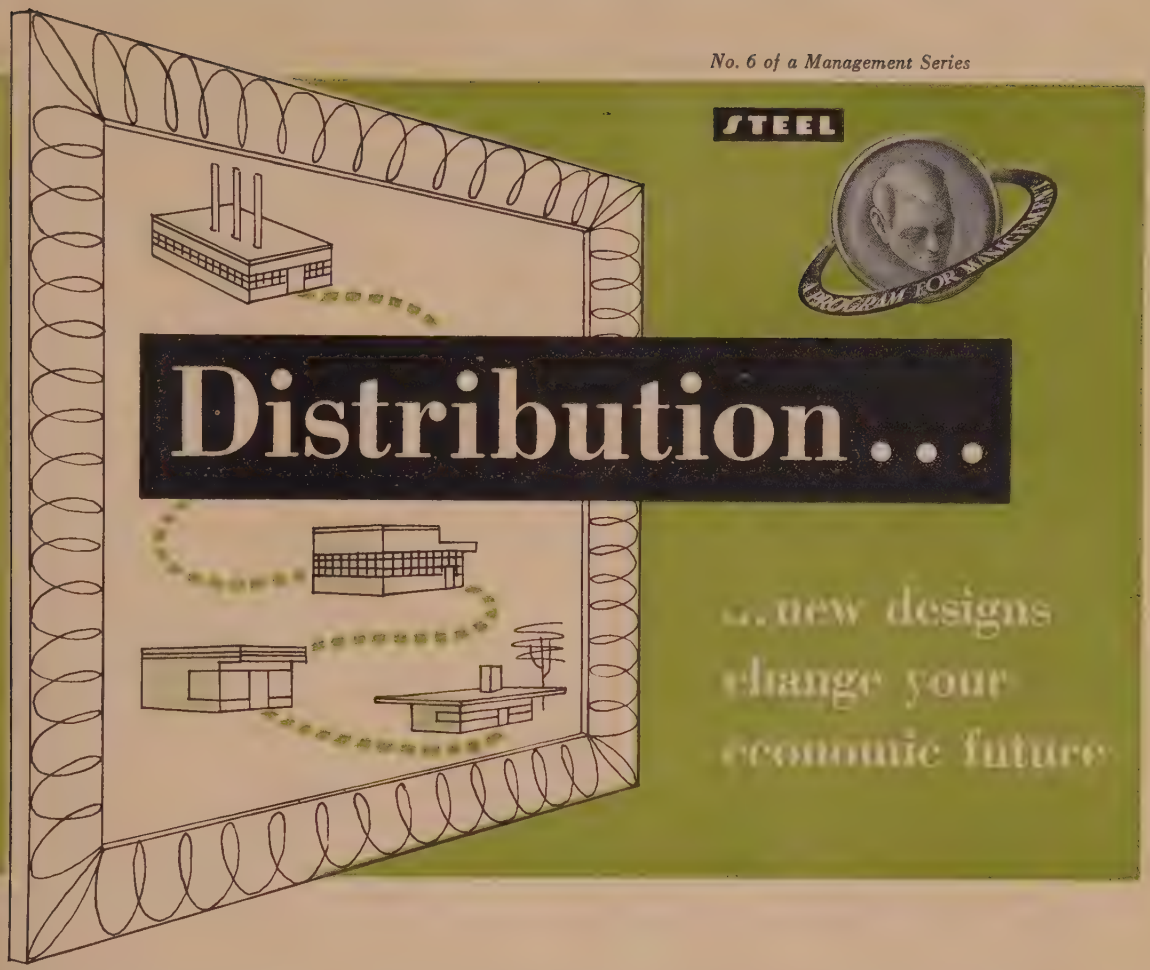
Sharp employment increases point out the giant strides being made in metal goods industry in the once-predominantly agricultural South, a survey by the Houston Chamber of Commerce notes.

The greatest percentage employment increase in the past six years was noted in Dallas, which had a 223.9 per cent increase. Other city increases are: Atlanta, 165.8; Ft. Worth, Tex., 138.8; and Memphis, Tenn., 137.6. However, Birmingham still leads in total employment with 45,000.



The editors of STEEL herewith present the sixth in a series of ten articles in this publication's Program for Management. The complete list:

1. Public and Community Relations (Feb. 23, page
2. Industry-Government Relations (Mar. 30, page
3. Research, Basic and Product (Apr. 27, page
4. Purchasing (May 25, page
5. Business Forecasting, Midyear Review (June 29, page
6. Distribution—Post-Emergency Challenge
7. Labor and Industry Relations
8. New Materials
9. Depreciation and Re-Equipment
10. Market Research



AT YOUR CALL is an open sesame that can keep wide the door to prosperity and improved profits.

The password is "distribution." You need no magic to master it, but you do need skill, ingenuity and imagination to make it work.

Definition — The Chamber of Commerce of the United States says distribution "includes all activities of retail, wholesale, advertising and service industries, as well as sales and marketing functions of manufacturers." That definition includes transportation.

Charles Harbaugh, manager of the chamber's Domestic Distribution Department, believes: "The failure of distribution in the 1930s was one big factor in the depression of that era." Under Secretary of Commerce Walter Williams says: "Persons taking the view that depressions are inevitable are starting from a false bottom. A new approach to distribution can give renewed impetus to our economy." T. V. Houser, vice chairman of the board for Sears, Roebuck & Co., points out that distribution "so far has received inadequate attention by the engineer and technician."

Shot in Arm—Many economists agree that the nation needs a giant vitamin shot about once every 50 years to keep prosperous—and thus far it has received such economic ministrations about on schedule. In the early 1800s it was the nation's emergence as a separate and independent political entity that fostered fast economic growth. In the late 1800s the railroads knit the country together for hitherto undreamed of business developments. In the early 1900s, the invention and development of the automobile led to a social and economic revolution for the U. S.

Now the time has come for something else. What will it be? Atomic energy? Possible but not probable as long as the government keeps such a close rein on its uses. Furthermore, a lot of technical problems about atomic energy still must be solved before it can be fully harnessed. Scientists think its full-scale use is still a half-century away, a vitamin shot tentatively scheduled to revitalize the economy in the early part of the twenty-first century.

Comes the Revolution—What we need is a boost right now, and signs are numerous that it's coming from a new approach to distribution. The impact of distribution on the economy is indicated by the effect railroads had in making possible mass production in the latter half of the nineteenth century. That development was really one of distribution. The depression of the 1930s was a warning sign that we needed new distributive techniques. At that time we could make all the goods we needed; the problem was how to distribute them at a profit.

The emphasis on production made necessary by World War II and the Korean affair has obscured the need for new distributive ideas and turned the creative forces of our economy to other channels. Yet in a process described as a

"revolution by inches," distribution is already beginning to change markedly, particularly at the retail level.

Proof Positive—You have seen what's happening: Self-service food stores, suburban department stores, giant shopping centers, more attention to parking areas. A clue to the dramatic metamorphosis in retail, service, wholesale and advertising establishments that's going on now is that the entire distributive picture has changed in some manner three times since the end of World War II. Those changes include new addresses, new ownership, new names or new establishments.

The revolution that has hit retail, service and wholesale phases of distribution is only just beginning to affect manufacturers. Under Secretary of Commerce Williams says, "It's time that manufacturers take a new look at distribution and learn what it can do for them."

Antidote — Better distribution could be the antidote to the steady upward cost-price spiral we have been experiencing since the end of World War II. Sears' Mr. Houser believes that "today wage demands are probably beyond the point of being offset by immediate technological improvement. Management can look upon such improvements merely as a brake on rising prices instead of permitting an expanding market through lower prices."

He and other economists speaking at a distribution conference held in Boston last fall believe that the nation must look to distribution for further efficiency and cost reduction, and thereby improvement in living standards. Fortunately the opportunities for cost-cutting and improvement in distribution are as breath-taking as they once were in production. That's not saying that no cost-cutting and improvement will come from production phases of the economy from now on. That's just saying that the production field has been heavily farmed for the past 10 or 15 years and that the distribution field looks like it has more promising soil.

Cost of Distribution—Sears took a group of important items of wearing apparel, home furnishings, home building and sporting goods. The average of those items indicates that the amount paid by the consumer, omitting the value of raw materials purchased by the factories, would divide 31 per cent for the cost of producing the goods, including factory profit, and 69 per cent for distribution costs, including distributors' profit. Include the value of raw materials purchased by the factories, and the division would still be 47 per cent for cost of production versus 53 per cent for cost of distribution. The breakdown on a single item, a television set, is shown in the accompanying table.

Obviously, any procedure that will lower this distribution cost will have the same effect on markets and sales as a technical cost reduction through scientific improvement of production processes in the factory.

What Can You Do?

But what can you, a manufacturer, do? Plenty. If you're a maker of nuts and bolts, you may think the distributive end of your immediate business is minor and that the distributive aspect of the product which uses your fasteners is far out of your bailiwick. Yet you can do a lot to improve and reduce costs in your distributive process even if such expenses are far less than half of your total costs. Distribution of the end-product that uses your fasteners is also of concern to you and decidedly your business because declining sales of washing machines, automobiles or what-have-you will mean declining sales for you, too.

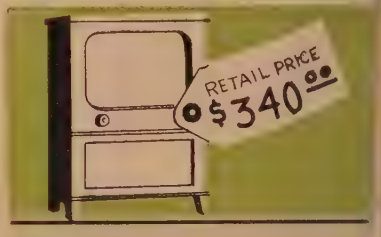
Call for Betty Furness—One business man says: "To improve distribution, all you need do is get about 100,000 Betty Furnesses on the job selling television sets and other consumer durables." While better selling is one answer to better distribution, the solution, regrettably, is not that simple, if only because there are not 100,000 Betty Furnesses.

Market Research—The first thing to do in tackling problems of distribution is to get the facts. How much does distribution cost you? Are you selling to the right markets? Are you overlooking uses for your product? All that comes under the heading of market research, a field to which industry has been devoting increased attention. The fact that industry has made such progress here is an encouraging sign that metalworking management is beginning to realize more clearly the importance of distribution. (No detailed analysis of market research will be given here because it's a subject worth separate analysis and will be so treated in a later article in STEEL's series on a Program for Management).

Accounting — A second area where distribution can be improved is in accounting. Undoubtedly, better results could be had from the estimated $4 billion being spent on paperwork annually to distribute all U. S. products. Today in the distributive processes there's nothing comparable to the statistical picture of what's going on in productive processes. We know value added by manufacture, but not value added by distribution. We know to the fraction of a cent what it costs to produce 100,000 widgets compared to 10,000. But it's rare to know what it costs to distribute 100,000 widgets, compared to 10,000.

Metalworking management is in a position to take the initiative here, as it already has in market research. It possesses the know-how from experience in cost-accounting for manufacturing. And it has the experience in making

Distribution: Half the Cost



Cost of Production (Including Maker's Profit)	$165-170
Taxes & Royalty	$20
Manufacturer's Distribution Cost	$15-25
Other Distribution Cost and Profit	$135-150

ne equipment for such purposes.

A trend toward improved accounting in distribution is discernible. Probably nearly $3 billion worth of office equipment is already used by U. S. distributors. A St. Louis wholesaler, for example, just installed a complete new business machine setup, one of the most modern ever devised for his type of operations. The installation costs him only $700 a month. He figures that the services of 17 people, whose total monthly salary is more than seven times the cost of the equipment, can be freed for other work now. Think of the savings if some of the 2 million clerical employees in distribution could be freed for other jobs.

Training—A third area where distribution can be improved is in personnel training. Here again metalworking management could take the initiative because of its long experience in training programs. The Chamber of Commerce estimates that 10 per cent of today's 17 million people engaged in distribution are still inexperienced, or in a period of training, a higher ratio than exists in manufacturing. It's costing about $1.5 billion a year to train distributive personnel, also relatively more than it's costing in manufacturing. That situation results chiefly because distribution is attracting people at a faster rate than almost any other segment of our economy. The 17 million in distribution now is 43 per cent greater than in 1940. The number of manufacturing personnel has increased 40 per cent.

What's needed by distribution personnel are some of the techniques used by manufacturers to train their men—high caliber supervisors, movies to show how the job should be done, longer training periods.

Integration — A fourth area where distribution can be improved is in closer integration between manufacturing and distribution. The industry now doing the best job of such integration is automotive. An auto manufacturer has employees who do nothing but work with dealers. Not only do they give information about the product, but they have schools to train dealers' personnel, provide market research about the dealers' areas and even give advice on how to design a showroom and service department.

Other manufacturers can do that, too. Tinnerman Products Inc., for example, provides its customers with information that it can pass along on the advantages of Speed-Nuts, its special kind of fastener. Merely a good description of the product on the package by the manufacturer would aid distribution a lot.

Another kind of integration is made possible with such distributors as Sears. It worked out arrangements with manufacturers of the highly-seasonable shot gun whereby they could maintain stable production with stable employment over the entire year even though the demand for the gun in August, the peak month, has been as much as 69 times higher than in April, the lowest month.

By calculating demand in advance and ordering in advance, Sears enabled its suppliers to keep their variation in number of employees at not more than 10 per cent. Sears' Mr. Houser says, "Case studies show a year-end saving of at least 10 to 12 per cent in cost when a highly seasonable article is produced steadily throughout the year" instead of irregularly according to the vagaries of demand.

Better integration between manufacturer and distributor is also

Distribution: Cost Is Rising

Merchandising Service Payroll	$21,000,000,000
Non-Selling Service Payroll of Distribution	21,225,000,000
Employee Benefit Expense	8,000,000,000
Costs of Financing Distribution Inventory	1,000,000,000
Cost of Constructing New Distribution Buildings	1,000,000,000
Construction Expenses for Maintaining and Modernizing Existing Buildings (includes installation of permanent equipment items)	2,000,000,000
Interest Cost of Financing Consumer Credit	1,000,000,000
Insurance Premiums	1,000,000,000
Supplies and Equipment Expenses for Paper Work	1,000,000,000
Transportation Expense	15,000,000,000
Taxes Paid by Distribution	10,000,000,000
Advertising	5,000,000,000
Communications	500,000,000
Gifts	200,000,000
Permanent Display Expense	1,000,000,000
Temporary Display Expense	500,000,000
Building Occupancy Expense	2,000,000,000
Maintenance and Replacement of Special Service Equipment	500,000,000
Packaging	5,000,000,000
Storage	2,000,000,000
TOTAL	$98,925,000,000

* All figures are estimates. Figures given under each general type of service include some duplication of expenses incurred for other types of services. A few items of expense are non-cash items, such as discounts to employees on merchandise purchased.

Source: Chamber of Commerce of U. S.

17 Million
PEOPLE IN
DISTRIBUTION
Retail & Wholesale . . 11 million
Service . . . . . 4 million
Transportation . . . . 2 million
TOTAL . . . . 17 million
Source: Chamber of Commerce of U. S.

feasible sometimes through possible elimination of one phase of distribution. Muntz Industries Inc. does this and claims a lower price of at least $100 per television set as a result. It has a factory-to-you setup whereby it owns its own factory branches and eliminates the wholesale step or assumes its functions in the distributive process. Muntz claims that the arrangement means savings in transportation, warehousing, inventory and higher morale of sales personnel, which all contribute to the lower price.

Success of the system is indicated by the fact that Muntz television set sales are now averaging 20,000 a month, compared with 10,000 a year ago. The company is also using the same technique to market its new home air conditioning units. Don Adams, Muntz vice president for sales and the man responsible for Muntz' sales approach, believes, "Any product selling for $50 or more should be sold factory-to-you."

Mr. Adams is in the minority. Many sales executives believe that Muntz and similar outfits have not eliminated any of the distributive links, but merely assumed their functions. While the technique may be satisfactory for a medium-sized firm, it's too expensive for a smaller company and doesn't provide enough sales coverage for a larger manufacturer. (Muntz has 43 outlets throughout the country; Westinghouse for TV alone has hundreds.)

Still another way to improve integration is through faster communications. Here the business press and other media play a vital role in their new equipment listings and through advertisements in their pages about new products or new uses for products.

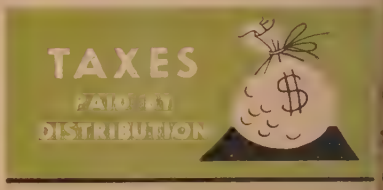
Freight — A fifth area where there's great opportunity to improve and cut the costs of distribution is in freight. The nation's transportation bill was about $15 billion in 1950. It will be an estimated $17 billion in 1953. While some of that increase results from greater traffic, the average cost of hauling a ton of freight one mile today is about 10 per cent greater than three years ago. The job is to get better value for that $17 billion or the same value for less money. On the average, freight accounts for about 10 per cent of the total cost of an item.

One way to get more value for your transportation dollar is to allow your traffic manager a freer hand. All too frequently, he's not even considered part of management in many metalworking companies today. But he should be a man of executive caliber because he can save—or lose—you thousands of dollars yearly. He can save dollars by knowing what kind of transportation is cheapest and best according to the size of the shipment and distance of the haul. He should know when it's best to own your own trucks and when it's best to use common carrier. A traffic manager for an Indiana company saved his company $10,000 a year by getting it to buy its own truck to ship short-haul stampings. A New Jersey producer of small aluminum parts saved nearly $15,000 a year because its traffic manager studied the rate differentials between parcel post and Railway Express.

Muntz, for example, figures it is saving $300,000 a year by operating its own truck fleet instead of using common carriers. Its trailers are specially designed to haul the maximum number of sets, a feature that isn't practical for most common carriers. The Muntz trucks are used on return trips to haul parts from suppliers, to return rejects and to transfer sets from one branch to another according to the shift in sales trends.

You can also get around high freight costs by building more, but smaller, plants to be nearer both your suppliers and your markets. A recent National Industrial Conference Board report shows that for the last five years 29 per cent of plants built or purchased were in towns of under 10,000 and 64 per cent in towns under 100,000. So, factories are following the trend of the population—and the market—to disperse with smaller but more numerous productive units.

Yet there are some dangers in this trend to dispersion. While plants can become too big to be economic, they can become too small, too. Studies by the Department


TAXES
PAID BY
DISTRIBUTION
Income Taxes . . . . . $5 billion
Property Taxes . . . . . 1 billion
Social Security . . . . 500 million
Excise Taxes . . . . . 1 billion
Sales Taxes . . . . . 2 billion
License, Privilege . . . 250 million
Motor Vehicle . . . . . 100 million
YEARLY TOTAL . $9.85 billion
Source: Chamber of Commerce of U. S.

of Defense indicate that the major reason for defense contractors' failure to fulfill a contract is that the company was too small to do the job or was attempting to do it in a plant that was too small.

Indications are that some reduction in distribution costs will result from greater efficiency of railroads and trucks themselves. Since World War II, railroads have spent $8 billion on improvements and have brought about a "revolution in motive power" by the installation of nearly 18,000 diesel-electric locomotive units. They have purchased more than 500,000 new and improved freight cars, thousands of new and diversified passenger cars and 12 million tons of new rail. The railroads are striving to become even more efficient becau

they're losing out to the trucks. Thirty years ago the railroads were handling 80 per cent of all intercity freight in the U. S. By 1950 that figure had fallen to 60 per cent, and the downward trend has not yet been reversed.

Trucks aren't standing still, either, and promise to give ever more efficient service. The nation's truckers spent $3.7 billion in 1952 for new trucks, trailers and replacement parts and may be spending about $10 billion annually by 1975. Some 9.5 million trucks are now on the road; an estimated 20 million will be hauling cargo by 1975, predicts American Trucking Associations Inc.

And the two rival modes of transportation show signs of greater co-operation, too. The New Haven Railroad and others, for example, have a special service whereby they'll transport truck trailers. Pullman-Standard Car Mfg. Co. is designing a special flat car for the purpose.

Greater efficiency for the nation's distribution system may also come about through practical development of new modes of transportation, even though they now seem like a Jules Verne dream. Pittsburgh Consolidation Coal Co. has invested millions in a coal pipeline at Cadiz, O., whereby coal is emulsified and pumped like oil. If the scheme proves practical, the first commercial line will run from southern Ohio to Cleveland. The overland belt conveyor idea still has its proponents, too, although that scheme appears to be losing a battle of attrition. The proposal is for a conveyor belt to run from Cleveland to the Ohio river to move bulk commodities. Also in the Buck Rogers state of development is the idea of giant sky trains to carry bulk shipments by air nearly as cheaply as by road or rail.

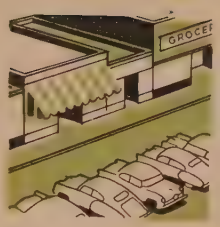
Warehousing — A sixth area where distribution may be improved lies in warehousing. The trend in this field is to use as little warehousing as possible. From 1941 to 1951, public warehouse space available for general merchandise declined from 105.5 million square feet to 90.9 million square feet. Privately owned space for general merchandise has increased over the decade, but the total available now is probably not much greater than it was in 1941. Because so much more goods are being produced today than in 1941, there has probably been a relative decline in warehousing space in ratio to production. Yet total floor space doesn't tell the whole story. The 100,000 people working for the nearly 2800 public warehousing firms are stacking goods much higher.

They're making greater use of mechanical inventory-tabulating equipment, too, as well as more conveying and materials handling equipment. Sears, for example, ten years ago had no conveyors in its warehouses. Now all of its facilities are so equipped.

Warehousemen are taking a leaf from the big shopping centers, too. The trend is to big warehousing points away from traffic congestion, such as Horseheads Industrial Center near Elmira, N. Y. It's a one-time military depot now designed to give Western manufacturers a main warehouse for all the East. It saves on warehousing costs in expensive, congested areas. Horseheads permits you to consolidate cars to gain carload rates with LCL conveniences. Like other such new warehousing centers, it permits you to process, assemble, pack and ship from one point so that you can save on long hauls with bulk shipments; and save by making short hauls of your goods in final form for sale.

Horseheads and other warehousing centers like it all will contribute to greater efficiency and help reduce the current storage outlay which averages between 3 and 5 per cent of the consumer dollar.

Selling — A seventh distribution area where industry has a good opportunity to cut costs and improve is in selling. About 6 million people are engaged in selling of all kinds in the U. S. today. Although that's a 20 per cent increase since 1940, the gain has come largely in retail and whole-



Distribution Changes In Past 15 Years

1. **Increased adoption of methods of self-service, reduced selling costs and increased volume through a wide emphasis on impulse buying.**
2. **Modern warehousing and improvement in the technique of goods handled, including increased mechanization, improved layout and similar devices.**
3. **Planned grouping of retail stores into shopping areas with adequate parking facilities.**
4. **Acceleration of the movement toward branch store operation in suburban areas to meet shifts in population.**
5. **Great strides in packaging and product-labelling.**
6. **Wider adoption of retail and wholesale store modernization.**
7. **Extension of consumer credit, including entry of commercial banks into field of financing deferred payments on consumer goods.**
8. **Steady increase in the use of trucks.**

sale establishments. While no exact figures are available, it is estimated that the increase in the number of salesmen for manufacturers amounts to less than 10 per cent. The Chamber of Commerce estimates that the total number of salesmen will remain constant, but that there will be gains for manufacturers' salesmen and declines for retailers'.

Total annual selling expense is an estimated $20 billion for the American economy. The job is to get more value for that money and more efficiency for salesmen.

Many manufacturers feel they now have a 1953 plant and a 1939 sales force. If you have a selling problem, a good recourse could be to seek outside help from management consultant firms, market research organizations or sales analyzers. Here's the kind of advice you'll probably be getting:

Dust off your salesmen. Inaugurate sales training programs, such as Carborundum Co. (STEEL, May 4, p. 66) has. Hire more sales-engineers, if you can find them.

Look to improved service and follow-up as a means to improve sales. Service schools are often advisable for your leading service managers across the country. Such schools co-ordinate sales efforts and at the same time give your service representatives a first-hand knowledge of new products.

Re-examine your dealerships, distributorships and arrangements for manufacturer's agents. You may be duplicating areas and not covering others. Especially on the increase are agents. At present about 5000 of them are selling metalworking products on a contingency basis, compared with about 4100 in 1948 and 3500 in 1939. They handle sales amounting to an estimated $3 or $4 billion annually. Agents, who usually charge a 5 per cent commission, are especially useful for small and medium-sized companies who can't afford their own sales branches. In Detroit alone are nearly 800 manufacturer's agents.

Take a look at wholesalers as one way to distribute your product. Wholesalers are still very much in the distribution picture. Some 210,000 of them currently do an annual sales volume of $212 billion, compared with $188.7 billion in 1948, $54.9 billion in 1939 and $66.7 billion in 1929. Wholesalers are an especially good media if you want a lot of independent retailers serviced economically. Wholesalers mostly handle consumer goods. Distributors usually concentrate on industrial goods used to produce end-items or consumed in the finished products.

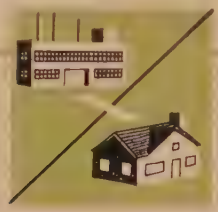
Be sure that you're selling your product through the right channel. For example, neither a wholesaler nor a distributor may be your correct media. Perhaps it's an industrial or mill supply house that's best suited for your product. It specializes in handling precision tools, regular hand tools, abrasive products, mechanical rubber goods, fasteners, tubing, bearings and similar items. Industrial supply houses did a $4.5 billion business last year and expect to do $5.5 billion in 1953. They do their own market research, advertising and sales engineering (as do wholesalers and distributors in many instances).

Re-examine your retail outlets if you sell in that manner. Department stores, for example, are slipping. Before World War II, they received 7.8 per cent of the retail sales dollar. By 1952 their portion had dropped to 6.3 per cent and to 6.0 per cent in the first quarter of 1953, National Industrial Conference Board reports.

Re-examine your advertising. In 1952 the nation's advertising budget was $7.2 billion, or 2.5 per cent of the national income. In 1940 it was $2.1 billion or 2.6 per cent of the national income. In 1933 it was $1.8 billion or 3 per cent of the national income. Under Secretary of Commerce Williams thinks current advertising spending may be too little.

A Matter of Balance

Selling is the climax of the whole distribution system, so it's not surprising that the most attention is lavished upon it. "That's the trouble," points out a New York distribution expert. "Selling, of course, is important, but it's only one part of the whole distributive setup. So much attention is lav-



You Can Improve Distribution . . .

1. **Initiate More Market Research**
2. **Develop Distribution Accounting**
3. **Inaugurate Better Techniques To Train Distribution Personnel**
4. **Integrate More Closely Manufacturing and Distribution**
5. **Whittle Down Freight Costs**
6. **Get Better Warehousing**
7. **Sell Better, More Efficiently**
8. **Campaign for More Help on Distribution from Your Trade Association and Local, State or National Chambers of Commerce**
9. **Campaign for More Help from Local, State and National Governments**
10. **Fight To Lower Taxes on Distribution**

ıed upon it that the other dis-
ibutive functions are often neg-
ted."

Aiming to get balanced attention
r all functions of distribution are
ganizations like the Chamber of
ommerce and the U. S. Depart-
ent of Commerce.

Clinic—The chamber's Domestic
istribution Department, managed
y Charles Harbaugh, is imple-
ienting an informational program
o make industry realize the impor-
ance of distribution. It's running
series of Distribution Clinics, the
ext one scheduled for Saginaw,
fich., in September. The chamber
urveys the area in advance for its
ales and manufacturing facilities,
arking areas, traffic problems,
opulation and income levels.
rmed with all that information,
hamber experts are ready to give
dvice to anyone in the area on all
istribution problems.

In one clinic already held, dis-
ribution men in a southern city
were convinced after the clinic that
hey had been advertising incor-
rectly, trying to reach a farm mar-
ket which had largely disappeared
during and since the war. They
switched their approach to the
more urban population which had
gradually developed in the area
over the past decade.

More Help — Under Secretary of Commerce Walter Williams says the federal government, through the Department of Commerce, will henceforth concentrate strongly on distributive matters, a concentration that has not been particularly evident for the past 20 years. The department's Office of Distribution, set up last fall, will serve as a focal point for distributive problems. The aim is to get distributive management's viewpoints heard in government. The department also aims to stimulate recognition of the importance of distribution through speeches and statements by government officials. This is already being done, especially by Mr. Williams.

The department also wishes to disseminate more widely the vast amount of market information it gathers. In its publication, *Survey of Current Business,* is contained some 4000 statistical series. And the department has available even

How's Your Distribution I.Q.?

Indicate whether the following questions are true or false. Score all correct answers 5 points. A grade of 80 or better indicates that you are aware of the increasing importance of distribution. Turn this page upside down to learn to correct answers.

1. **A failure of distribution was one big factor in the depression of the 1930s.** T F
2. **The great distribution advances made recently have been made by manufacturers, not retailers.** T F
3. **Distribution offers little opportunity for cost-cutting.** T F
4. **Distribution may account for as much as half the final cost of an end-item.** T F
5. **A new look at market research is one of the first steps to improve distribution.** T F
6. **We can't figure value added by manufacture, but we can calculate value added by distribution.** T F
7. **Since 1940 manufacturing employment has risen more than distribution employment.** T F
8. **Under some circumstances, it's possible to bypass phases of distribution.** T F
9. **Traffic managers should be allowed more authority.** T F
10. **Floor area has declined in public warehouses since 1940.** T F
11. **The gain in numbers of salesmen since 1940 has come largely in retail and wholesale establishments.** T F
12. **Most manufacturers are up-to-date on their selling techniques.** T F
13. **Wholesalers are an especially good sales media if you want a lot of independent retailers serviced economically.** T F
14. **The department store share of retail sales has been slipping since World War II.** T F
15. **The U. S. Department of Commerce is starting a series of Distribution Clinics.** T F
16. **Taxes on distribution have been a handicap to the U. S. economy.** T F
17. **The Federal Trade Commission looks like it's going to be as legalistic as ever in its interpretation of the trade laws.** T F
18. **The mystery and ignorance about distribution costs has been one reason there has not been general compliance with Robinson-Patman.** T F
19. **The railroads in the mid-nineteenth century made possible a revolution in distribution.** T F
20. **Industry should not take the initiative in furthering a new revolution in distribution.** T F

Answer Key to True-False Questions:

1.T 2.F 3.F 4.T 5.T 6.F 7.F 8.T 9.T 10.T 11.T 12.F 13.T 14.T 15.F 16.F 17.F 18.T 19.T 20.F

more information vital to market research and distribution which it wants to publicize more. The department is also considering doing more specialized market research and statistical work which is partly financed by trade associations or groups of businesses. Emphasis in such studies will be on distributive information and on related matters.

Not So Helpful

Not so helpful to the distribution system have been other actions by the U. S. The table shown on p.60 indicates that taxes paid along the line in distribution total about $10 billion annually. That's a drag on distribution that must be eased—and soon.

Another drag has been the Federal Trade Commission and Justice department interpretations of the laws affecting distribution. It's significant, incidentally, that the U. S. over the years generally has encouraged production with its defense load programs and fast tax write-offs. What's more, there have never been laws regulating industrial production, except in NRA days.

Rare Aid—But on the distribution side, federal aid in depreciation concessions and defense loans has been far more rare than in manufacturing. The railroads got aid in the form of land grants years ago, but now they claim they're thwarted by federal rate rules. The trucks get the use of public highways, but they also pay high taxes. Inland waterway carriers get the advantage of federal-developed channels, locks and harbors, but the cargo carried by them is far less than that hauled by railroads and trucks.

But an even more serious handicap to distribution has been past interpretation of federal laws influencing that activity—notably the Robinson-Patman amendment to Section 2 of the Clayton Act, and Section 3 of the Clayton Act. The exact meaning of Robinson-Patman has been debated for years. Until recently the majority on the Federal Trade Commission has held that the key to an understanding of that measure is the philosophy that "price" means the seller's mill net return. That's what the buyer pays, less the cost of transportation. On that theory a seller who sells the same product at the same price to two customers, located at unequal distances from his plant, receives discriminatory varying mill net returns.

The Reason Why—On that reasoning, then, freight absorption, basing point and similar pricing systems are illegal. That's the big reason why the steel industry radically changed its distribution ideas in 1949, abandoned the basing point system and went to f.o.b. mill pricing, the only procedure it was certain was legal. Nobody knows exactly what that has meant in added distribution costs to steel buyers, but Frank R. Nichols, president of Nichols Wire & Aluminum Co., Davenport, Iowa, estimates $65 million annually.

Section 3 of the Clayton, involving exclusive dealing contracts, has also been a trial to distributors, particularly those handling consumer goods.

Relief—Many of those difficulties should be relieved soon under a new policy by the Federal Trade Commission. In September the balance of power on the commission will shift 3-2 in favor of the Republicans and by that time Chairman Edward F. Howrey, a Republican, should be able to implement a new rule-of-reason policy that he has already outlined. The chairman believes that "the right to meet a lower price which a competitor is offering to a customer, when this is done in good faith, is the essence of competition and must be permitted in a free competitive economy." Previously the commission held that "good faith" was not an adequate defense against charges of price discrimination, notably in matters of freight absorption.

Mr. Howrey outlined his ideas when he wrote to support S. 1377, a bill introduced by Sen. Homer Capehart (Rep., Ind.) which would write into law the principle that a seller may lower his price to one customer to meet the price of a competitor, without violating Robinson-Patman—in other words, the seller can absorb freight. Mr. Howrey has persuaded a majority on the commission that Congress should pass a law clarifying the confusion on this distributive matter.

Guides — The commission also plans to formulate guiding yardsticks in matters arising under the Robinson-Patman act. "The main reason for failure to obtain general compliance with the act," says Mr. Howrey, "is the mystery and ignorance (both in industry and government) which surround distribution costs." To get good cost studies, the commission will establish an advisory committee on cost justification. The commission likewise would set up a Bureau of Consultation which for the first time would be available for consultation by businessmen and empowered to give them advance clearance on distribution, pricing and other policies. Also, a majority on the commission now favor the rule of reason on distributive matters and other cases.

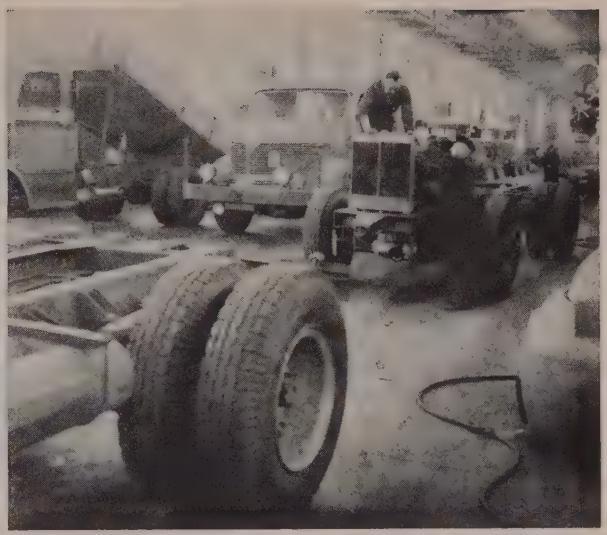
Instead of taking a strict legalistic view on its cases, the FTC would use reason in handing down its decisions. It would take into account changing economic conditions and would bear in mind that Robinson-Patman was passed during the bleak days of the 1930s and other statutes even earlier.

The Big Change

Big changes are coming in distribution. The FTC's more liberal viewpoint illustrates that, as does the evolution in retail selling, the increased experimenting with factory-to-you selling, the attempts to get around high transportation costs and increased emphasis on industrial selling.

Those are all signs that we're already started or about to embark on a "revolution by inches" in distribution, comparable to the impact upon our economy of the auto in the early twentieth, the railroads in the late nineteenth and American independence in the early nineteenth centuries. Industry can take the initiative in the metamorphosis by channeling to distribution some of the creative energies it has so successfully turned to production problems in the past.

If industry does awake to the possibilities in distribution, a new open sesame will certainly come to keep wide the door to prosperity and improved profits.



Wide World

Pounding Cannons Into Trucks and False Teeth

The Krupp cast steel works, Essen, which were two-thirds destroyed during World War II, demonstrate a pressing problem in Germany today: Where can the Germans get the investment capital needed to rebuild and expand industry?

The Krupp works in Germany, known best for its production of heavy weapons of war, now busily turns out the products of peace, ranging from false teeth to locomotives. Trucks roll off the production line at the Krupp car works in Essen.

German Steel Price Cuts Coming

German steelmakers are planning to cut prices as surplus stocks of steel begin to pile up at the mills. Look for more German competition from steel products to end products

GERMAN STEEL producers will probably slash prices in an attempt to cut a way out of their present dilemma.

They find themselves priced out of nearly all markets, domestic and foreign. Surplus stocks of steel are accumulating at the mills even though rate of production is decelerating. German steel men, nonplussed early in 1953 because Germany had become a net importer of steel, are chagrined that their competitive position hasn't improved much since then.

It Hurts—All those factors press on a very sore point for German steel producers right now. The Germans would like very much to expand their steelmaking and steel processing capacities. The investment capital market in Germany is pitifully small, however, and other industries, such as railways and power companies, are making demands upon it. Thus, expansions of the German steel industry have had to come mostly from retained profits.

It's the retained profits which will be squeezed in the price cuts coming up and further plant and equipment expansions will fade into the future.

Statistically — German steel prices are nearly four times the prewar level: For bars, $97 a metric ton now compared with $27 a metric ton in 1938; plates, $109 a ton now from $31 a ton in 1938; sheets, $126 compared with $35. Where general industrial prices rose from an index of 100 in 1938 to 226 currently, prices of iron and steel products jumped from an index of 100 to 354 over the same period. Prices of electrical goods, which contain much steel, rose only from 100 to 183.

Production of iron and steel rallied slightly in June but has been bumping down since the first of the year. Pig iron output in March was 1,143,000 tons; in April 978,000 tons; in May 949,000 tons and in June 944,000 tons. Output of steel ingots went from 1,467,000 tons in March to 1,275,000 tons in April, to 1,165,000 tons in May and to 1,259,000 tons in June. The German steel import-export balance is somewhat better but not encouraging. Imports shrank from 176,000 tons in February to 113,000 tons in March; exports mounted from 59,000 tons in February to 72,000 tons in March.

Super-cartel — The European Coal & Steel Community was expected to free steel prices from the chains of cartel price-fixing, but the effect of ECSC thus far has been to stabilize prices at the level of the highest community producer like an international cartel. German producers and metalworking manufacturers aren't satisfied with that. They began negotiations with German Minister of Economics Ludwig Erhard last month with a view to reducing German prices.

Profits will be squeezed, cherished expansion plans will have to take their chances, but it will mean increased competition by German steel for American, British and Japanese steelmakers.

British Imports Shift

Britain imported 157,057 tons of steel in May, 1953, of which 3534 tons came from the U. S. and 15,367 tons came from Belgium. A year ago, Britain imported 269,666 tons, of which 113,954 tons were bought from the U. S. and 31,552 came from Belgium.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Watch for a federal agency to be created to help rehabilitate handicapped persons. Some 28 million in the U. S. comprise a potential reserve of manpower

WASHINGTON has not seen anything quite like the show put on before the House Labor Committee during its hearings, which ended July 28, on the proposal to establish a federal agency concerned solely with rehabilitating handicapped persons so that they can become employable and productive.

Mary Krasnogor, a 30-year victim of muscular dystrophy, appeared in a wheel chair to tell the committee of her uphill battle. She now runs a successful real estate business at Framingham, Mass., but attained this status of security in the face of almost insuperable difficulties. Federal or state aid is needed, she pleaded.

Help Needed — Similar stories were told by multiple amputees, cerebral palsy sufferers and other handicapped persons who contended that most handicapped can be employed usefully—if given training and guidance. Among them was General Melvin J. Maas, original member of the President's Committee on Employment of Handicapped, former Republican member of the House from Minnesota, now a blind veteran.

Rehabilitated handicapped persons last year, he said, earned $100 million and paid income taxes of over $30 million. He estimated at 28 million the number of handicapped persons. Of these about 2 million have been rehabilitated and job-trained and are now "as productive as any other person." On an average, he said, they actually out-produce the nonhandicapped. What has been done for these 2 million, he said, can be done for most of the remaining 26 million.

Help Expected—The committee is expected to come up with a favorable report on the proposal to establish a federal agency for the handicapped—particularly because a total war mobilization would at once take 15 to 18 million for the armed forces, leaving a big gap that could be filled only by the handicapped.

The subject is of interest to industry which would employ the great bulk of the handicapped. It was brought out during the hearings that U. S. Steel Corp. alone employs over 7000 handicapped persons.

Bureau of Standards Split . . .

The planned split of the National Bureau of Standards between the Commerce and Defense Departments will not change the fundamental nature of the bureau.

The divisions to go to the Defense department are Ordnance Development, Electro-mechanical Ordnance, Electronic Ordnance, and Missile Development—in other words, the four divisions that work exclusively in defense. These are to be placed under the Army chief of ordnance.

The other 13 divisions remain under the Commerce department.

Of the bureau's 4800 employees, 1600 are in the divisions going to Army Ordnance; the move, according to a joint statement by Secretaries Charles E. Wilson and Sinclair Weeks, is to prevent a loss of emphasis on the bureau's basic work. While nothing has been said publicly to that effect, it is known that the Defense department is giving serious consideration to the proposal to transfer to private enterprise on a contractual basis much of the ordnance research and development work now done by bureau personnel.

'Tis Fair for All . . .

Secretary of Defense Charles E. Wilson says he approves of the armed services installing scrap baling presses. It is the practice in industry, he says, to install such presses in order to secure the maximum price for scrap metal.

"I see no harm," he said, "in our military people doing the same thing. If they are getting as much for the scrap as it costs them to bale it or a little more, then I think they should bale it." The Institute of Scrap Iron and Steel Inc. had objected to the Navy's activities in baling scrap.

EDWIN C. BARRINGER
. . . leads scrap over scrap

Mineral Imports Questioned . . .

Senator Joseph McCarthy (Rep. Wis.), chairman of a Senate Government Operations Subcommittee has announced plans to hold hearings in Idaho, Michigan and Nevada on possible "danger" to the mining industry by reason of the government's metals stockpiling program. He said there is a serious question of whether the national security is impaired by government decisions to "purchase minerals from abroad while a sizable number of American mines have been forced to close up."

Navy Uses Lost Wax Casting . . .

Navy Ordnance is using the lost wax foundry process in a limited way. In some of its own foundries it is using the technique for producing castings which by usual production methods would require difficult and expensive machining.

With the lost wax method machining is largely eliminated.

Westinghouse saves in excess of $57,000 per year by FORK TRUCK HANDLING

A fleet of fork trucks including Bakers, coupled with intelligent planning and material handling engineering, enables Westinghouse Electric Corporation to cut handling costs more than $57,000.00 per year at its huge East Pittsburgh works. Savings in which the Baker Trucks participate, include:

- **$12,000.00 warehousing raw materials in the molded materials section**
- **Another $12,000.00 handling finished molded products**
- **$9,000.00 on one scrap handling operation**
- **$7,500 by handling castings on pallets in yard storage**
- **100% added storage capacity in molded materials warehouse**
- **Doubling capacity of drum storage space in yard**

These savings were made possible by replacing manual handling and other slow methods with efficient fork-truck unit-load handling. In some instances Westinghouse devised special pallets and containers to achieve greatest speed and efficiency from their versatile Fork Trucks.

Illustrated above is a special stringer pallet which enables Baker Fork Trucks to tier and transport drums four at a time, doubling storage capacity and speeding these operations substantially by eliminating manual methods.

This method of handling scrap saved $9,000.00 in one year. Driver merely operates controls—the truck does the work.

Handling castings in yard storage on pallets with Fork Trucks saves $7500.00 per year over former methods—and multiplies storage capacity by tiering.

By palletizing bagged materials for fork truck handling, tiering to warehouse ceiling more than doubles storage capacity. This method cuts handling costs $12,000.00 per year.

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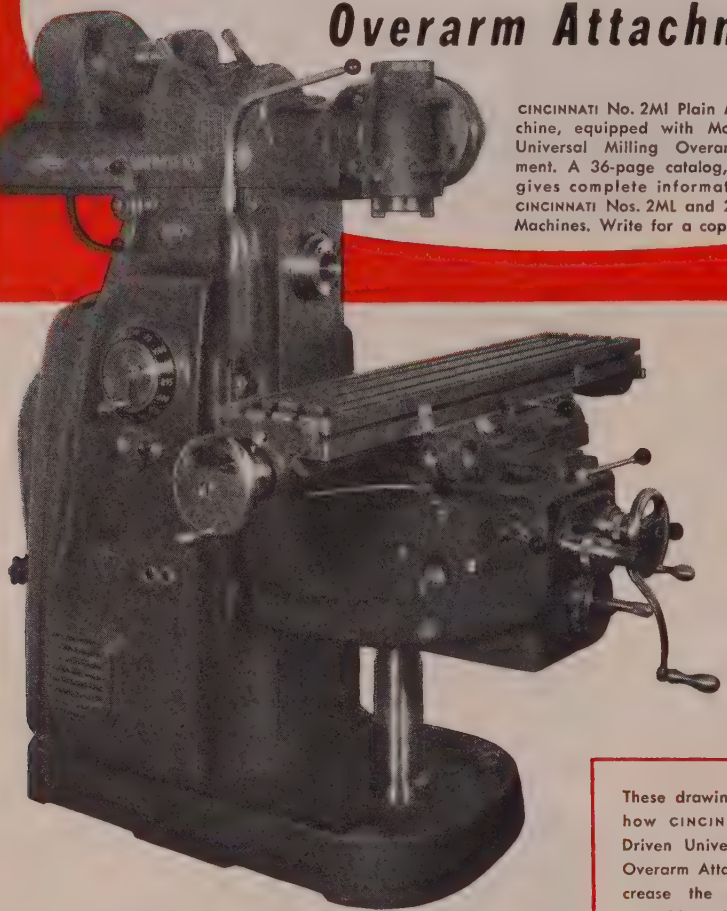
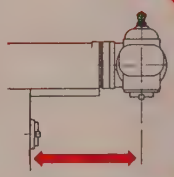
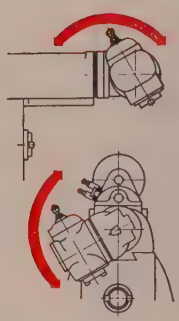
Increasing the job possibilities

with Cincinnati Motor Driven Overarm Attachment



CINCINNATI No. 2MI Plain Milling Machine, equipped with Motor Driven Universal Milling Overarm Attachment. A 36-page catalog, M-1662-2, gives complete information about CINCINNATI Nos. 2ML and 2MI Milling Machines. Write for a copy.





These drawings illustrate how CINCINNATI Motor Driven Universal Milling Overarm Attachments increase the range and versatility of CINCINNATI knee-type milling machines. Complete information in publication No. M-1661-1.

How many times have you needed a little extra range or extra versatility for a milling setup? Just think how much it would have saved! You can get all the extra range and versatility you will need on your CINCINNATI knee-type milling machines by equipping them with Motor Driven Overarm Attachments. ¶ Consider the CINCINNATI No. 2 MI, for example. Of itself, it offers a host of advantages; convenient and easy speed change with one lever . . . a similar feature at the front of the knee for feed changes . . . 16 spindle speeds, 60 to 1 ratio . . . 16 feeds, 120 to 1 ratio . . . unit construction for low-cost maintenance. To these advantages and many others, add the extra range and versatility offered by the Motor Driven Overarm Attachment, and you have a toolroom miller that can handle any job. ¶ The attachment is completely self-contained and replaces the standard machine overarm. Power is derived from a motor mounted on top of the overarm. There are two sizes, 2 hp for 2ML, 2MI and D[illegible] Types; 5 hp for Dial Types and High Power a[illegible] Dual Power Dial Types. You may obtain more information by writing for publication No. M-1661-1.

THE CINCINNATI MILLING MACHINE C[illegible]
CINCINNATI 9, OHIO

CINCINNATI

MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACH[illegible]
MACHINES • METAL FORMING MACHINES • FLAME HARDENING MAC[illegible]
OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

Hand Sheet Mill To Quit

The century-old Schuylkill Iron Works plant of the Alan Wood Steel Co., Conshohocken, Pa., will hang up the "for sale" sign on its steel rolling facilities sometime in August.

Modern continuous-type mills have made obsolete the old hand sheet mills like the Schuylkill plant, John T. Whiting, president, states. However, the firm's cut nail plant at Conshohocken will continue its operations.

Alan Wood Steel has spent $25 million in the past five years modernizing its rolling facilities at Ivy Rock and near record tonnages are being produced there, according to the officials.

"Approximately 200 of the 3700 employees will be affected by the change," Mr. Whiting declared, "and all who desire to be transferred to the newer operation can be absorbed within a reasonable period."

Titanium Plant Operation Set

Titanium Metals Corp. of America expects to get its new Henderson, Nev., plant into full operation by the middle of August. Capacity production with 1000 employees will be 3600 tons a year.

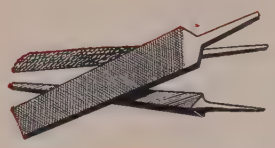
Owned jointly by National Lead Co. and Allegheny Ludlum Steel Corp., the plant was built as a magnesium operation during World War II for $240 million. Its conversion cost $20 million.

Labrador Concession Granted

Canadian Javelin Foundries & Machine Works, Montreal, has been granted a 2300-square-mile concession in southwest Labrador.

The land is held by the Newfoundland & Labrador Corp. which has 25,000 square miles of mineral rights in Newfoundland and Labrador and 5000 square miles of timber rights in Labrador.

The Newmont Mining Corp. and American Zinc, Lead and Smelting Co. were granted concessions in the Newfoundland holdings last year and are conducting $100,000 mineral explorations at present.



Smooth Going for Files

Activity follows general industrial prosperity. Inventory position is good

FILES, those ancient tools doing modern duty, are still riding high, and they'll probably continue to do so as long as the country enjoys prosperity generally.

There has been a slight inroad in sales of files made by the abrasive industry, but as one filemaker put it, the decline it causes in file business is so slight from year to year that it takes a four or five-year period to notice much of a pattern.

Sales—Actually, dollar sales are riding slightly higher than last year, partly because of the steel strike. But unit sales are down a bit. The difference shows the effects of the price rise after the strike settlement. A large industrial supply house in Cleveland says that the last price-hike in files was made last November. Since then, price and sales have been stable.

The two major users of files are metalworking and woodworking industries, with the latter dwarfed by the former. Several of the biggest users—automotive, steel and aviation—are still going full-speed ahead, and as long as they continue to do so, filemakers won't have to worry much.

No Change—The switch from a defense economy to civilian markets probably will not cause a flutter in the industry. Practically all files are sold through industrial supply houses and hardware wholesalers who do not keep records of end uses. But as the change comes gradually, they report no indication of it in sales.

Those suppliers report that delivery position from producers is getting continually better than even before last year's steel strike. Their inventories of files pose no problem because they can now order more often and in smaller quantities and receive quicker delivery. The matter of smaller quantities is of great importance to suppliers, because, as one buyer says, his firm stocks 50 to 75 different shapes ranging from 4 inches to 16 inches. Large quantities in each shape would take too much storage space.

So generally, things are smooth for these rough products.

Continued Research Aid Assured

Continued federal research support is assured, according to the first in a series of reports by the National Science Foundation.

The report indicates that for the year ending June 30, 1952, $338 million out of a $2.2 billion of federal funds expended for research and development went toward financing research at nonprofit institutions.

Only 225 of 700 potential educational institutions receive federal funds. This is largely accounted for by more fully developed scientific facilities and staffs of the institutions and by critical national defense needs. Many existing college scientific resources are not being utilized.

The increase in government research has also resulted in the establishment of "research centers" which are operated by the nonprofit institutions at a cost of $159 million.

Studies to determine the impact of government supported research will be continued, Dr. Alan T. Waterman, director of the foundation, reports.

Million Ton Manganese Deal Set

Bethlehem Steel Co. has a contract approved and registered with the Brazil national accounts court for getting a million tons of manganese. The ore will come from deposits in the Amapa area, a coastal section north of the Amazon river. Contract runs until 1968.

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Farm Implements

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N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Your product can be made stronger . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

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NATIONAL STEEL CORPORATION

KEEP YOUR SCRAP MOVING TO YOUR DEALER

By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom

One Hour's Production Heads for the Showrooms

Thirty-four trucks loaded with 136 new Buicks—one hour's production by Buick assembly plants—exemplify record high production levels maintained by the auto industry during the first six months of 1953. Total production for Buick during that period was nearly 300,000 cars, the biggest six months in the company's 50-year history

This writer's reaction to seven days' driving of the Willys, on p. 72, completes a one-week test of a car from each major manufacturer. Here's a general opinion

DETROIT

THERE IS PROBABLY a best car for your requirements, finances and personality, but there is no best car for everybody.

That's the conclusion reached by this writer after 13,000 miles and 18 one-week tests of a car from each major manufacturer.

What's Average?—In the weekly summary of each test, you probably have noticed that most of the cars scored "better than average" in just about every characteristic. For purposes of comparison, average was a hypothetical midpoint of cars now on the road. A middle-price car of 1948 vintage was taken as the basis of comparison and the car of today stands much improved over that criterion.

All of the cars driven had basic similarities. They all had independent front suspension and good riding qualities. Suspension improvement is making the lighter car of today much closer to its heavier brother in this respect though the law of inertia has not yet been repealed. All cars had good glass area and fine visibility much improved over the car of five years ago. All cars had comfortable seats and good back support to make long trips less tiring. All cars offered attractive interiors, with workmanship and detail generally proportional to price.

Thorough Test — There are differences in automobiles and it is for this reason you must do a bit of evaluation on your own to decide which is most satisfying to you. In most cases we found our opinion of a car changing during the course of the week which indicates that a trip around the block is not enough to introduce yourself to an automobile. Before you buy any car, drive it under circumstances as varying as time permits, and if your wife drives, be sure she has an opportunity to try it also. Salesmen today are willing to spend more time than ever on a prospective customer, and you'll want to compare the different makes in the price bracket you're considering as well as driving just one car. This is the only function driver reaction reports can serve: To apprise you of some of the differences.

The cars produced by the independents, for example, are generally the innovators. Hudson's step-down design, Studebaker's styling, Nash's reclining seats and Kaiser's popout windshield are examples. These manufacturers do not expect to please the broad market but offer special reasons for buying their products. Thus, if you like the Studebaker styling, do not need the extra space other cars offer and are still young enough to not mind squatting a bit to get into your chariot the Studebaker will appeal to you.

Solid Big Three—The cars produced by the Big Three seldom take chances with fundamental design and engineering changes. They are aiming for the common denominator and that includes the little old lady as well as the ex-GI. Their products must be as conventional as a small town minister or run the risk of sales tar and feathering. Evolution takes its course and changes are gradually adopted, but the whole situation is a little like wearing sports shirts to the office; it would be comfortable and satisfying but you can't afford to be flagrantly conspicuous. So you wear a white shirt with a loud tie.

By virtue of this conservatism, the cars of the Big Three generally tend to drop less in value, particularly in the four-door body style. The cars appeal to almost everyone and they change only slightly from year to year which means less drop in demand and hence in trade-in value. This tends to further enhance their appeal to the buyer who is not primarily concerned with being different. It does limit their ability to incorporate engineering and design features.

Cautious Change—The swing to the V-8 engine, for example, will

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permit greater performance, better maneuverability due to shorter wheelbases and improved visibility as hoodlines drop. It will not sacrifice economy and quietness to make this possible or the engine would not be adopted. Improvements, with few exceptions, are improvements without deterrent aspects or they are not made.

Emphasis may be placed on different virtues within this credo, however. The Hydramatic transmission, for example, offers top performance while the Dynaflow, Powerglide and Fordomatic sacrifice some performance for smoothness of operation. The Chrysler transmissions are a compromise between the two virtues. What are you after?

Matter of Opinion—That is the question you must ask yourself for cars have virtues that are a matter of opinion. Some one car probably has the virtues you desire and can finance. But no road test author or bar stool argument can settle the matter for you.

The American car is a tool for comfortable transportation. With that concept, some of the fun of driving has been lost. Regardless of the car you buy you will receive virtue in abundance. With the engineering and manufacturing skills of today, a car purchaser just can't go wrong.

Now where did we put the key to that MG?

Car of the Week

The final car of the week is the Willys Aero Eagle. It has gotten to the point where Cadillac can't pick up a newspaper any more without getting the Willys, a situation amusing in somewhat the same way as the sight of a mouse frightening a fat lady. The only thing to spoil this analogy is that the Willys is no mouse. This little blinger is just as hot as its advertising.

Visibility in the Willys is outstanding. The driver's view of the road extends right down to ten feet in front of the car and all four fenders are visible from the driver's seat. In the hardtop model tested, the rear posts are virtually non-existent permitting an almost unobstructed 360 degree view. Willys might well add fish-bowl visibility to its advertising pitch.

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453	570,464
May	685,390	542,559
June	713,206	542,479
July		226,134
August		322,755
September		595,715
October		656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
June 27	173,702	124,370
July 4	140,491	86,052
July 11	167,560	70,592
July 18	175,555	32,468
July 25	173,721	42,514
Aug. 1	172,000*	43,964

Sources: Ward's Automotive Reports.
*Estimated by STEEL.

Also way up the line is Willys handling. The Willys holds the road in top style at an indicated 85 mph with little wind wander and concern for surface deflection. It holds a corner like a leech with no tendency for the rear end to break loose or mushiness in the steering until well above cornering speeds for comparable automobiles. Body roll is slight and never out of hand.

The Willys engine utilizes the F-head design and is the only American production car to do so. Another rather well-known car employing this setup is the Rolls Royce, probably slated for Willys advertising fame next year. With this design the exhaust valves are in the block while the intake valves are in the head, giving a highly efficient setup. The Willys tested with overdrive averaged over 25 miles per gallon at speeds around 70 mph indicating mileage close to 30 miles per gallon or better as a reasonable expectancy.

Acceleration from a standing start was somewhat better than average and in high gear on the open road and around town acceleration was notably good. Overdrive on this car did not hinder acceleration noticeably at speeds in excess of 50 mph and passing kickdown did the job adequately at lesser speeds.

Perhaps the most striking thing about the Willys, however, is the fact that it is not actually a small car. The front seat is wider than that of its three class leaders and the drive shaft and transmission tunnels do not interfere with leg room in the front seat. Three persons can ride in the front seat and the back seat with comfort comparable to that in many larger appearing cars. The Willys does not stint on passenger room.

The thing that makes this surprising is the Willys' wheelbase of 108 inches and over-all length of only 180 inches. The answer is elimination of much overhang at the front and rear of the car which gives a smaller appearance to the car yet provides the virtues of easier parking and traffic maneuverability.

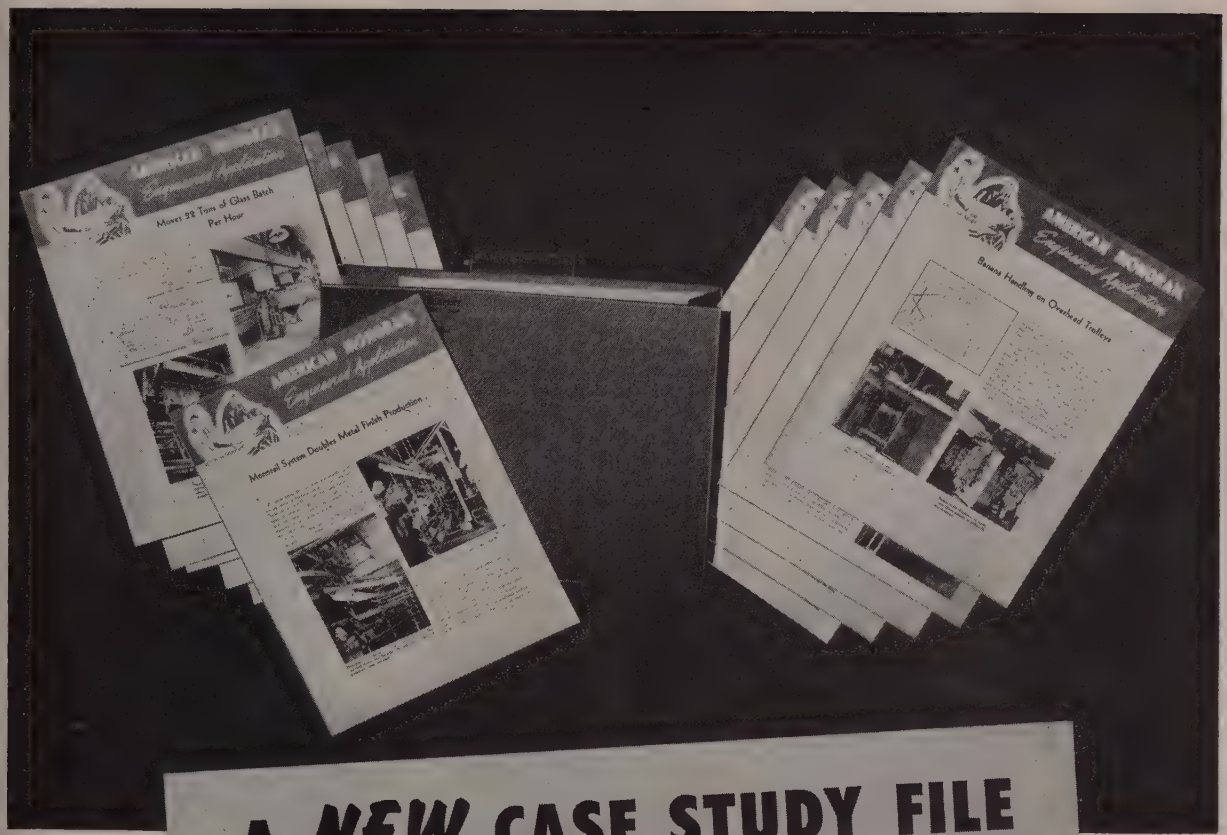
Interiors are adequately done in the conventional models, attractive in the hardtop models tested though not lavish. Seating is comfortable and a 200 mile trip in the Willys over a four-hour period did not prove tiring.

Detracting from the Willys were such liabilities as a disconcertingly limber trunk lid construction, a tin-box type glove compartment which not only had sharp corners but was shaped in such a way that everything slid to the front, and placement of the radio on the passenger side of the dash difficult to reach by the driver. Repair of damage to what would normally be a fender will in many cases require costly replacement of a major portion of the body owing to the Willys mode of construction.

But the Willys is a likeable jackrabbit capable of standing on its own. It hardly need restrict its sales to "second cars for Cadillac owners."

Cleaning the Desk

Now undergoing final engineering tests at the Nash engineering section in Detroit are five preliminary production models of the Nash NKI. Originally understood to be scheduled for introduction in September, it now looks like November before these English-built economy packages will hit U. S. roads.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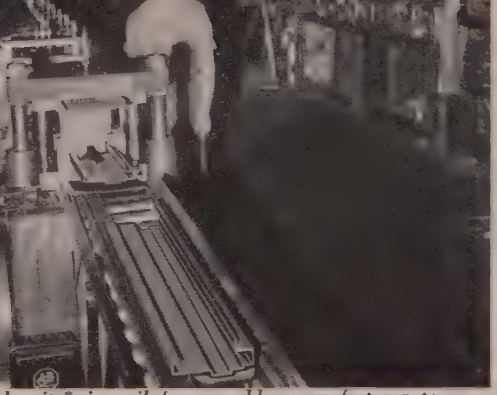

lvanite in coil form enables manufacturer to hieve tremendous production at minimum costs.*

hree special window casement sections, fabricated Galvanite, ingeniously lock together to form mplete weather-tight casement.*

Plant foreman for one of the nation's largest window manufacturers p severe bend that caused many inferior coatings to flake. Galvanite lic problem for them.*

WHY LEADING WINDOW MAKERS LIKE RUST-RESISTING GALVANIT

The wonderful thing about Galvanite*, Sharon's high quality zinc coated steel, is the way the coating stays with the base metal through the most severe fabricating operations. This is because Galvanite* is a special process hot dip type coating which causes the zinc to actually bond with the steel.

For example, Galvanite* has a wide acceptance in the manufacture of steel windows, doors and casings . . . for here they must have a steel that will resist the weather for years on end, take paint easily and hold it while subject to the abrasions of normal window operation. Many of these window manufacturers tried several types of coated steel before "discovering" Galvanite*, but actual on-the-job tests quickly proved the superiority of this excellent steel.

Whether your business is windows, or the manufacture of any other product that demands top quality weather-resisting steel it will pay you to look into the Galv story. Sharon steel specialists will be happy to wor you, at your convenience, in applying Galvanite* t product. We're sure that once you use it, you, as hun of others, will specify Galvanite* every time. It' much better!

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SHARONSTEEL

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Philadelphia	Rochester
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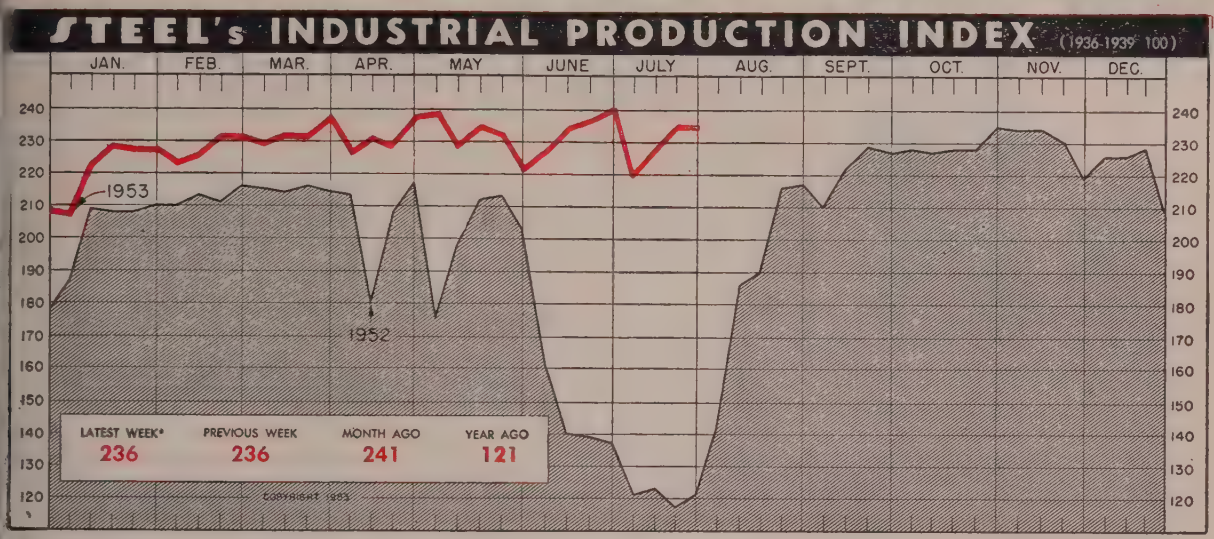
*Trade name copyrighted by Sharon Steel Corporation

Wherever There's Weather — Specify GALVAN



*Week ended July 25 Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%

For the first time in history civilian sectors of economy are on a high level following military action. Tax relief is needed for continuance of lofty production

PEACE NEGOTIATIONS in Korea have come at a time when the general economy of the nation is on a high level. For the first time in this country's history, following a major military undertaking, the civilan sectors of the economy are on a lofty plateau.

Only a month ago America's horn of plenty poured forth the greatest industrial output, ever. Now it has receded from that hill to the high plateau. During the week ended July 25, STEEL's index of industrial production was only five points below that altitude, as it stood at 236 per cent of the 1936-1939 average.

Management's Problem — Paramount question is how to dispose of these goods. Unless the slipping demand is fortified, industrial production will suffer. And even a small plunge in industrial output would reduce the incomes of many, which in turn would make the problem of selling more severe.

A larger supply of credit does not seem to provide a complete answer. There is more credit available since the Federal Reserve System has reduced the reserve requirements of its member banks. On the other hand credit terms are stiffer. Moreover, the use of credit is already extensive and it appears that a great many people don't want it. And those who don't need credit seem to be conservative in their purchases.

Probable Answer — Therefore, the tax relief coming next January will be most welcome. With no excess profits tax, corporations should be able to increase their net income after taxes per dollar of sales, which has been chipped away in recent years. Dividends should increase, and stockholders have more to spend or save. Should the shareholders save this money, the banks would be able to increase their resources and credit.

Future Promise—Net effect of these tax changes should be a fortifying of industrial production. More than that it should expand in the same fields and in newer ones, for the buying of goods really creates the need for other goods.

Meanwhile, our economy is shaping up like this.

Steel Prognostication

Furnaces of the steel industry poured 2,180,000 net tons of steel for ingots and castings during the week ended Aug. 1, says the American Iron & Steel Institute. This is slightly more than in the previous week, during which the estimated national rate was 96 per cent of capacity. And the output for the remainder of the year will probably be close to this figure, for many steel men believe a rate of 94 to 95 per cent is highly probable since order backlogs remain high.

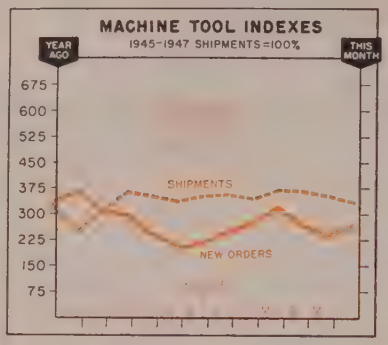
Inventory Skidmarks

Although the automobile turnout in July will consist of the highest monthly volume since 1950, production will skid downward commencing Aug. 3, as Chrysler and Packard start taking inventory. About 80,000 workers will be affected by the Chrysler action, which will result in only partial production until Sept. 30. Packard will close down production completely, but for only one week.

During the week ended July 25, automobile and truck output of U. S. and Canadian plants totaled 173,721 units, according to *Ward's Automotive Reports*. Overtime work at General Motors and Ford offset curtailed output at Chrysler and some independents.

Orders Lag

For most industries new orders have recently lagged behind sales

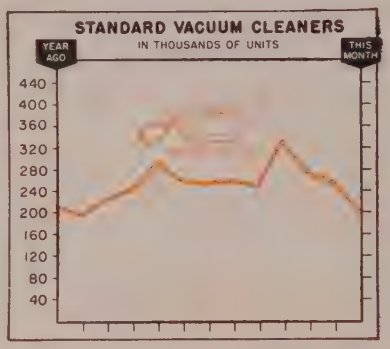


Machine Tool Indexes

1945-1947 Shipments=100

	New Orders		Shipments	
	1953	1952	1953	1952
Jan.	255.8	347.8	361.6	266.6
Feb.	282.1	318.8	354.5	279.6
Mar.	327.0	324.3	375.9	299.5
Apr.	276.8	293.5	372.7	307.9
May	246.4	284.6	356.4	323.0
June	272.8	342.9	341.1	330.8
July	....	....	376.3	....	259.7
Aug.	....	....	311.1	....	317.0
Sept.	....	....	302.4	....	368.3
Oct.	....	....	243.3	....	357.8
Nov.	....	....	205.4	....	342.5
Dec.	....	....	225.2	....	355.0

National Machine Tool Builders' Assn.

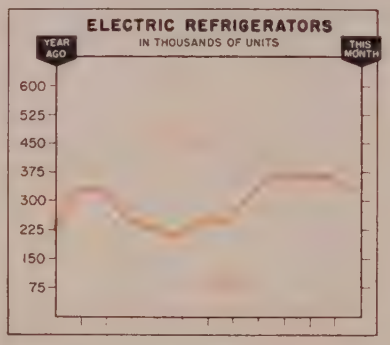


Standard Vacuum Cleaners

Sales Billed—Units

	1953	1952	1951
Jan.	255,886	223,357	282,305
Feb.	246,007	230,226	261,572
Mar.	329,294	290,032	290,242
Apr.	268,548	217,169	227,216
May	252,404	216,969	201,983
June	197,506	206,939	194,548
July	....	.....	188,715	161,002
Aug.	....	.....	222,413	191,299
Sept.	....	.....	237,541	210,086
Oct.	....	.....	292,474	259,469
Nov.	....	.....	254,297	219,919
Dec.	....	.....	249,032	230,263
Total	...	.....	2,841,803	2,729,104

Vacuum Cleaner Mfrs. Assn.

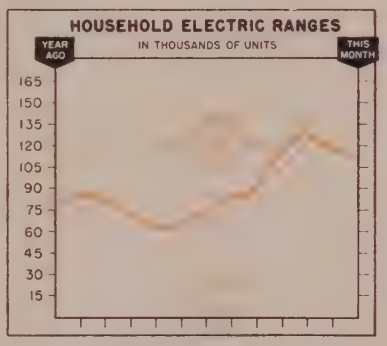


Electric Refrigerators

Total Factory Sales—Units

	1953	1952	1951
Jan.	325,186	260,259	465,903
Feb.	377,605	259,838	403,035
Mar.	368,498	276,972	558,503
Apr.	366,951	225,994	409,887
May	317,667	217,017	309,722
June	....	.....	324,885	261,298
July	....	.....	333,877	163,922
Aug.	....	.....	250,224	165,309
Sept.	....	.....	230,111	193,929
Oct.	....	.....	207,065	191,519
Nov.	....	.....	256,530	147,394
Dec.	....	.....	248,506	195,403
Total	....	.....	3,091,434	3,465,824

National Electrical Mfrs. Assn.



Household Electric Ranges

Total Factory Sales—Units

	1953	1952	1951
Jan.	88,145	79,982	130,316
Feb.	114,465	63,063	121,585
Mar.	130,788	93,225	159,865
Apr.	118,999	69,149	118,823
May	114,404	68,117	106,685
June	.....	86,847	106,589
July	.....	83,465	60,530
Aug.	.....	74,853	64,042
Sept.	.....	62,404	93,551
Oct.	.....	63,143	109,043
Nov.	.....	72,982	101,476
Dec.	.....	84,630	72,140
Total	.....	901,860	1,244,645

National Electrical Mfrs. Assn.

Charts Copyright 1953 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....July 6	Gear Sales .....July 13	Radio, TV .....May 25
Durable Goods ....July 13	Gray Iron Castings..July 20	Ranges, Gas .....May 18
Employ., Metalwk. .July 6	Indus. Production ..June 22	Steel Castings ....July 20
Employ., Steel ....June 1	Ironers .....June 29	Steel Forgings ....July 20
Fab. Struc. Steel...July 13	Malleable Castings..July 20	Steel Shipments ...June 22
Foundry Equip. ...July 27	Prices, Consumer ..June 22	Wages, Metalwk. ..July 6
Freight Cars .....July 27	Prices, Wholesale ..July 27	Washers .....June 29
Furnaces, Indus. ..July 13	Pumps .....July 27	Water Heaters ....June 29

with the result that the current backlog is down a little from the level prevailing since the middle of 1951. A prominent exception is air conditioners, where shipments during the first half of the year were 215 per cent over the like period a year ago. Also, new orders for machine tools rose 26.4 per cent from May to June. An increase in defense expenditures and rising civilian demand account for the increase, which sent the index of the National Machine Tool Builders' Association to an estimated 272.8 per cent of the 1945-1946-1947 average.

Price Adjustments

With production of most goods adjusting downward to demand, the recent price increases don't seem to be in order, yet with costs rising, prices force their way upward. For example, General Electric Co. raised prices on 12 of its 15 electric ranges by from $5 to $20. Admiral Corp. and Philco Corp. increased prices on some of their television models. The Philco suggested price raise for dealers will be $10 on 5 new models and the Admiral list price increase will be from $20 to $40 on 21 of its newly introduced 1954 models.

The upward price changes give added encouragement to discount houses. In New York state, one appliance firm finds that discount houses pop up faster than it can get injunctions to enforce price maintenance on fair-traded items.

Price Indexes

In view of the increased costs it is surprising that the wholesale price index for all commodities other than farm and foods is now moving upward faster. During the week ended July 21, it stood at 114.5 per cent of the 1947-1949 average, only 0.6 per cent higher than in June, according to the Bureau of Labor Statistics. The consumer price index is being pushed upward mainly by the recent increases in retail food prices. But it won't be long before the higher prices for durable goods shove it up beyond the present record level.

The increase in consumer prices means that the purchasing value of the dollar is being reduced further

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	96.0	96.0	15.5
Electric Power Distributed (million kwhr)	8,460	8,209	7,328
Bituminous Coal Output (daily av.—1000 tons)	1,533	1,142	1,102
Petroleum Production (daily av.—1000 bbl)	6,560[1]	6,551	6,071
Construction Volume (ENR—millions)	$253.4	$264.2	$278.2
Automobile, Truck Output (Ward's—units)	173,721	175,555	42,545
TRADE			
Freight Car Loadings (unit—1000 cars)	800[1]	791	607
Business Failures (Dun & Bradstreet, number)	184	148	137
Currency in Circulation (millions)[3]	$30,051	$30,163	$28,884
Dept. Store Sales (changes from year ago)[3]	+2%	+11%	−2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,177	$15,932	$16,378
Federal Gross Debt (billions)	$272.5	$272.4	$263.0
Bond Volume, NYSE (millions)	$11.4	$12.4	$13.8
Stocks Sales, NYSE (thousands of shares)	4,471	4,628	5,120
Loans and Investments (billions)[4]	$80.0	$76.1	$76.6
United States Gov't. Obligations Held (billions)[4]	$33.3	$29.3	$33.4
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	189.33	189.33	181.31
STEEL's Nonferrous Metal Price Index[6]	225.9	225.2	224.6
All Commodities[7]	111.0	110.5	111.8
All Commodities Other Than Farm and Foods[7]	114.5	114.5	112.5

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1953, 2,254,459; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index. 1947-1949=100.

The dollar in June was worth only 55.6 cents, down 0.5 cents since the beginning of the year, the National Industrial Conference Board relates.

Construction Costs

The increased costs are strongly felt by the construction industry. In June, construction costs were 573 per cent of the 1913 average, according to the American Appraisal Co. This is 6 percentage points more than in March and is partially responsible for the recent downward trend of construction. Already, production by three plywood concerns has been reduced to a four-day week to adjust to demand.

Retail Sales

Sales of retail stores, however, hardly changed between May and June. Total sales in June amounted to $14.7 billion, 6 per cent more than a year ago. Seasonal promotions are encouraging consumers to spend. Considering department stores alone, the difference between the four weeks ended July 18, and the like period a year ago is only 5 per cent. Moreover, the outlook is far from satisfactory. A total of 31 per cent of department stores were in the red during the first quarter, according to the National Retail Dry Goods Association.

Consumer Spending

From these sales figures it can be seen that consumer spending is on a high level. However, the spending seems to be tapering off. During June, expenditures by consumers declined slightly to 134.3 per cent on Dun & Bradstreet's United States Trade Barometer. In May these expenditures set a record of 136.5 per cent of the 1947-1949 average.

Failures Increase

A good indication of tougher competition is the increase in number of business failures. During June, failures rose to 817, the highest toll in three years, according to Dun & Bradstreet. These casualties were 22 per cent greater than the year ago level, and the June rate of failure for every 10,000 enterprises listed in Dun & Bradstreet's Reference Book was 35.8 concerns.

Trends Fore and Aft

May shipments of steel forgings were 191,000 tons . . . Aluminum wrought products shipped in May totaled 209 million pounds.

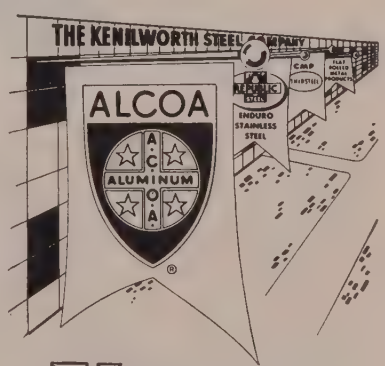
PUT UP ANOTHER SIGN, WE HAVE *Alcoa Aluminum*

SHEETS AND COILS, TOO

All right, Bill, the Alcoa trade-mark will go on the Kenilworth trucks right beside the other well known identifications. We're glad you're proud of this recent addition to Kenilworth's line of flat rolled metal products—all of us are and we believe our customers are, too.

AND KENILWORTH'S SERVICE GETS IT TO YOU QUICK!

You'll find a good inventory here of Alcoa coiled sheet and flat sheets in several analyses. Slit widths in coils or cut lengths and flat sheets are available in a wide range. So, Alcoa quality and Kenilworth service makes the ideal source for your aluminum needs—let us prove it today.



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. . . TONGS FOR EVERY GRABBING PROBLEM

M. W. TOWNSEND
. . . assists president, Handy & Harman

JAMES J. DALTON
. . . AS&W cold-roll div. supt.

VIRGIL E. SLATER
. . . Forker sales manager

M. W. Townsend was appointed assistant to the president of **Handy & Harman**, New York, processor of silver, gold and platinum. With the company since 1946, he first joined the sales department and three years later was made assistant to the vice president in charge of sales. In 1951 he became sales manager. He is succeeded in the latter position by **Paul G. Feld**, former assistant to the sales manager at New York.

Nicholas D. Vuyosevich was made manager of the newly acquired Hi-Pac Division, **Worcester Pressed Steel Co.**, Worcester, Mass. Founded in 1947, Hi-Pac has been engaged primarily in development, manufacture and marketing of a new type, small, high-pressure gas cylinder. **Albert Manhartsberger**, chief engineer of Hi-Pac, also becomes associated with the new division.

Stephen R. Skrob was promoted to plant manager at **Rheem Mfg. Co.'s** South Gate, Calif., plant. He was formerly works manager.

Mason Phelps is the new president of **Pheoll Mfg. Co.**, Chicago, maker of threaded fasteners. He succeeds **Col. John Slezak**, who resigned in April to accept appointment as assistant secretary of the army.

American Steel & Wire Division, U. S. Steel Corp., appointed **James J. Dalton** division superintendent in the Cuyahoga Works', Cleveland, cold-roll division. He succeeds the late **Carl L. Radway**. Since last January he has been assistant division superintendent.

W. F. Sternberg was made manager of the loader manufacturing operations of **Pettibone Mulliken Corp.**, Chicago. He formerly was production manager of White Motor Co.'s Sterling Division and had been a vice president of Sterling Motor Truck Co. Inc. at Milwaukee.

Edward H. Fredrick was appointed assistant general manager, **Dynamatic Corp.**, Kenosha, Wis., subsidiary of Eaton Mfg. Co. He joined Dynamatic in 1949 as chief application engineer.

Harold F. Sommerschield was made assistant to the manager of Capitol Steel Division, **Hausman Steel Co.**, Toledo, O. His headquarters are in Lansing, Mich.

Curtis M. Yohe was elected to the board of **Mackintosh-Hemphill Co.**, Pittsburgh.

Frank J. Sheldon, treasurer, was elected to the board of **Hyman-Michaels Co.**, Chicago.

Virgil E. Slater, former eastern manager for Industrial Crane & Hoist Corp., has joined **Forker Corp.**, Cleveland, as sales manager. Before joining Industrial Crane, he organized and operated his own materials handling sales office in St. Louis, known as Slater Engineering Co.

Robert H. Burns joined **Inet Inc.**, Los Angeles, as general manager. He was formerly president of Marshall Engineering Co. of Santa Monica, Calif., and its subsidiaries, Instrument Components Inc. and Marshall Electronics.

Thomas Toby was appointed assistant vice president-sales in the Chicago office of **Russell, Burdsall & Ward Bolt & Nut Co.** to succeed **James M. Dill**, retired. **Willard B. Dunham** was made manager of western distributor sales, Chicago office, with **Vernon N. Paulson** manager, western industrial sales, moving from Chicago to the Rock Falls, Ill., plant.

Appointments at **Parker Aircraft Co.**, Los Angeles, subsidiary of Parker Appliance Co., include **F. E. Amon** as vice president-sales, **R. J. Trivison** vice president-manufacturing, **Warner B. McCarthy** secretary-treasurer.

Paul S. Goodwin was made engi-

JAMES J. STRNAD

ALBERT B. HARDING

W. J. BLAZEK

. . . head Lempco Products and subsidiary companies

neering manager by **Applied Research Laboratories**, Glendale, Calif.

James J. Strnad, previously vice president-general manager, is now president of **Lempco Products Inc.**, Bedford, O. He succeeds **James F. Strnad**, who headed the company for 35 years and continues as chairman of the board of Lempco and subsidiaries, Lempco Automotive Inc., Evans Reamer & Machine Co. and Lempco International Inc. **Albert B. Harding** assumes the presidency of Lempco Automotive with **John Y. Blazek** as executive vice president. **W. J. Blazek** moves up to the presidency of Evans Reamer & Machine Co., and in the export division **Dorothy R. Kimmel** was named vice president and general manger.

At the Gadsden, Ala., operations of **Republic Steel Corp.**, **T. H. Hagan** was named superintendent of steel works for the southern district. **J. J. Lloyd** was appointed superintendent and **J. L. Hamilton** assistant superintendent of the sheet mill.

Niagara Machine & Tool Works, Buffalo, announces that **J. H. Horton** rejoined its sales staff after serving in the Armed Forces. He will work out of the Philadelphia district office located in Wynnewood, Pa.

J. P. Schott succeeds **E. G. Hillman**, retired, as manager of the Louisville branch of **Wheeling Corrugating Co.**

Salem-Brosius Inc., Pittsburgh, appointed **Thomas E. Lloyd** director of sales; **John W. Holzwarth** sales manager, industrial products; **H. L. Lloyd** chief engineer.

Wilbur L. Nichols, formerly purchasing agent for Industrial Machinery Co., joins **Caine Steel Co.**, Chicago, as sales representative for Texas.

Made assistant chief engineers at Riverdale, Ill., plant of **Acme Steel Co.** are **Carl Persson** in the machine design engineering department and **Hugo H. Gustafson** in the production engineering department.

Dr. Lawrence D. Schmidt was appointed director of research for Semet-Solvay and Wilputte Coke Oven Divisions of **Allied Chemical & Dye Corp.**, New York. He succeeds **William Tiddy**, retired.

Stephen Tedor returns to **Royal Metal Mfg. Co.**, Chicago, as general merchandising manager.

Sharples Corp. Research Laboratories, Bridgeport, Pa., appointed **Dr. Edward M. Redding** as director of research. He assumes the post of **Philip P. Sharples**, who con

CARL PERSSON

HUGO H. GUSTAFSON

. . . assistant chief engineers at Acme Steel

For the long haul... Autocar relies on R B & W bolts

Famous truck builder rates them best for ease of assembly and accessibility

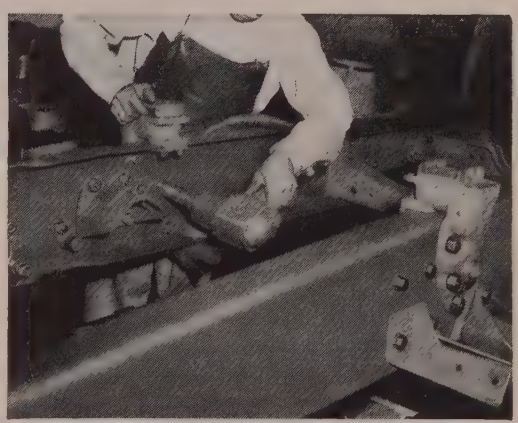
It's been a long time since the Autocar people switched from riveted to bolt-and-nut construction. Here's how it happened:

Two Autocar engineers took off on a coast-to-coast run to shake the bugs out of a new test model. Things went well until a riveted spring bracket broke. It took an entire day just to chisel through the rivets because it was hard to get at the bracket.

From that day on, it was *accessible* bolt-and-nut construction exclusively for all Autocar trucks. And Autocar standardized on RB&W bolts. One dividend from using these rugged bolts is that Autocar can specify higher-strength material than is practical for riveting. Furthermore, tests on structures like bridges show that rivets frequently loosen. This doesn't happen to bolts on Autocar frames.

Where you want to join structural members firmly together so they'll *stay* together for good, high-strength bolting is often your best bet.

As the leading manufacturer of all kinds of fasteners, we're in the unusual position of always being able to recommend and supply the right ones for all your needs. Write to RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N. Y.



FASTER FASTENING is achieved in the Autocar plant at Ardmore, Pa., by using air tools like the one shown here to run up RB&W nuts on RB&W bolts on an Autocar truck frame. In addition to making tight, accessible joints, bolting effects substantial assembly savings. 3.1

R B & W

108 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Plants at: PORT CHESTER, N. Y., CORAOPOLIS, PA., ROCK FALLS, ILL., LOS ANGELES, CALIF. *Additional sales offices at:* PHILADELPHIA, PITTSBURGH, DETROIT, CHICAGO, DALLAS, SAN FRANCISCO. *Sales agents at:* PORTLAND, SEATTLE. *Distributors from coast to coast.*

JACK L. MODRICH
. . . Mechanical Air Controls gen. sales mgr.

W. G. GERSTACKER
. . . Heil Process Equipment chief engineer

tinues as vice president in charge of research. Since 1948, Dr. Redding has been research director of the Charles F. Kettering Foundation.

Added to the staff of **Mechanical Air Controls Inc.**, Detroit, are **Jack L. Modrich** as general sales manager, **Edward L. Rodgers** as chief engineer and **Larry Newton** as purchasing agent. Mr. Modrich has been sales manager of Miller Motor Co. for the last ten years.

Berkeley Scientific Division, **Beckman Instruments Inc.**, South Pasadena, Calif., appointed **Hoyt A. Stearns** marketing manager to succeed **G. H. Bruns Jr.**, now general manager of the division. Mr. Stearns joins Beckman after serving General Precision Laboratory in Pleasantville, N. Y.

Heil Process Equipment Corp., Cleveland, appointed **W. G. Gerstacker** chief engineer. Other staff additions include **John M. Carpenter** as estimator in the lining and coating department and **Frank Babik** to a similar position in the fabricating department.

George E. Lott was elected vice president, **Trevor Steel Co. Inc.**, Centerline, Mich. He was formerly vice president and director of purchases, Motor Products Corp.

H. V. Stehl was elected vice president and general sales manager, **Inland Steel Products Co.**, Milwaukee. He has been manager at Baltimore. Mr. Stehl replaces **W. A. Jahn**, vice president in charge of sales, who becomes president. As general sales manager, Mr. Stehl replaces **Robert S. Schmieder**, retired after 36 years of service.

Hanson-Van Winkle-Munning Co., Matawan, N. J., assigned **Harold R. Smallman**, assistant vice president, to handle all of its affairs on the West Coast. His headquarters will be in Los Angeles.

Charles A. Shenberger was made manager of rolled ring sales for **Heppenstall Co.**, Pittsburgh. He has been associated with the sales department of Standard Steel Works Division, Baldwin-Lima-Hamilton Corp.

Paul J. Leonard was elected president, **Wagner Mfg. Co.**, Jackson, Mo. Mr. Leonard, one of the founders of the company, was formerly vice president and managing director. **L. L. McCain** continues with the company as vice president and sales manager.

Universal-Cyclops Steel Corp., Bridgeville, Pa., appointed **James D. Nisbet** director of research and development. He was manager of materials and process section at General Electric Co.'s research laboratory.

Howard S. Griffin was appointed Toronto representative for **American Nickeloid Co.**, Peru, Ill.

Brig. Gen. Stanley E. Ridderhof, U.S.M.C. (ret.) was promoted to vice president of **Rosan Inc.**, Newport Beach, Calif. He has been serving the firm as assistant to the president.

OBITUARIES...

Charles W. Abercrombie, 42, plant manager of **American Sintered Alloys Division**, Bethel, Conn., Yale & Towne Mfg. Co., died July 23.

Fred E. Moore Jr., 50, former vice president, **Lenape Hydraulic Pressing & Forging Co.**, West Chester, Pa., died July 22.

H. M. Stoneham, plant superintendent, **Kay-Brunner Steel Products Inc.**, Alhambra, Calif., died July 15.

Arthur J. Decker, 62, one of the founders of **Decker-Reichert Steel Co.**, Cleveland, died July 25. Currently chairman, he served as president for a number of years.

Frank McArdle, 56, sales manager and director, **Central Cable Corp.**, Jersey Shore, Pa., died July 21.

Francis L. Stephenson, 62, manager of structural steel sales for **Bethlehem Steel Co.**, Bethlehem, Pa., died July 24.

Hugh Kelly, 51, chief engineer and industrial engineer for **Perfex Corp.**, Milwaukee, died July 16.

George A. Spoon, 58, vice president, sales and engineering, **Muskegon Motor Specialties Co.**, Muskegon, Mich., died July 17. He was an authority on design and manufacture of camshafts, and had been with the company for 38 years.

Albert J. Hall, 60, vice president-manufacturing, **Clary Multiplier Corp.**, San Gabriel, Calif., died July 20.

Charles Dubinsky, founder and president, **Charles Dubinsky & Co.**, Austin, Minn., died July 16.

Paul W. Schreck, 58, plant manager, **Wisconsin Machinery & Mfg. Co.**, Milwaukee, died July 19.

Milo A. Baker, 85, head of **Baker Iron Works**, Los Angeles, died July 10.

Pressure Processing

. . . whoever uses it in their production is a customer or potential customer of **H-P-M**

36 NEW H-P-M

CARTRIDGE CASE PRESSES AT RIVERBANK ORDNANCE

This installation of 36 H-P-M All-Hydraulic Cartridge Case Presses at the Riverbank Ordnance Plant, Riverbank, California will give you an idea of the important part pressure processing and H-P-M play in this phase of America's defense program.

Heavy-duty design, semi-automatic, accurate control and exceptionally fast, smooth, shockless operation are good reasons why so many H-P-M cartridge case drawing, tapering and heading presses are now working round-the-clock production all over the country.

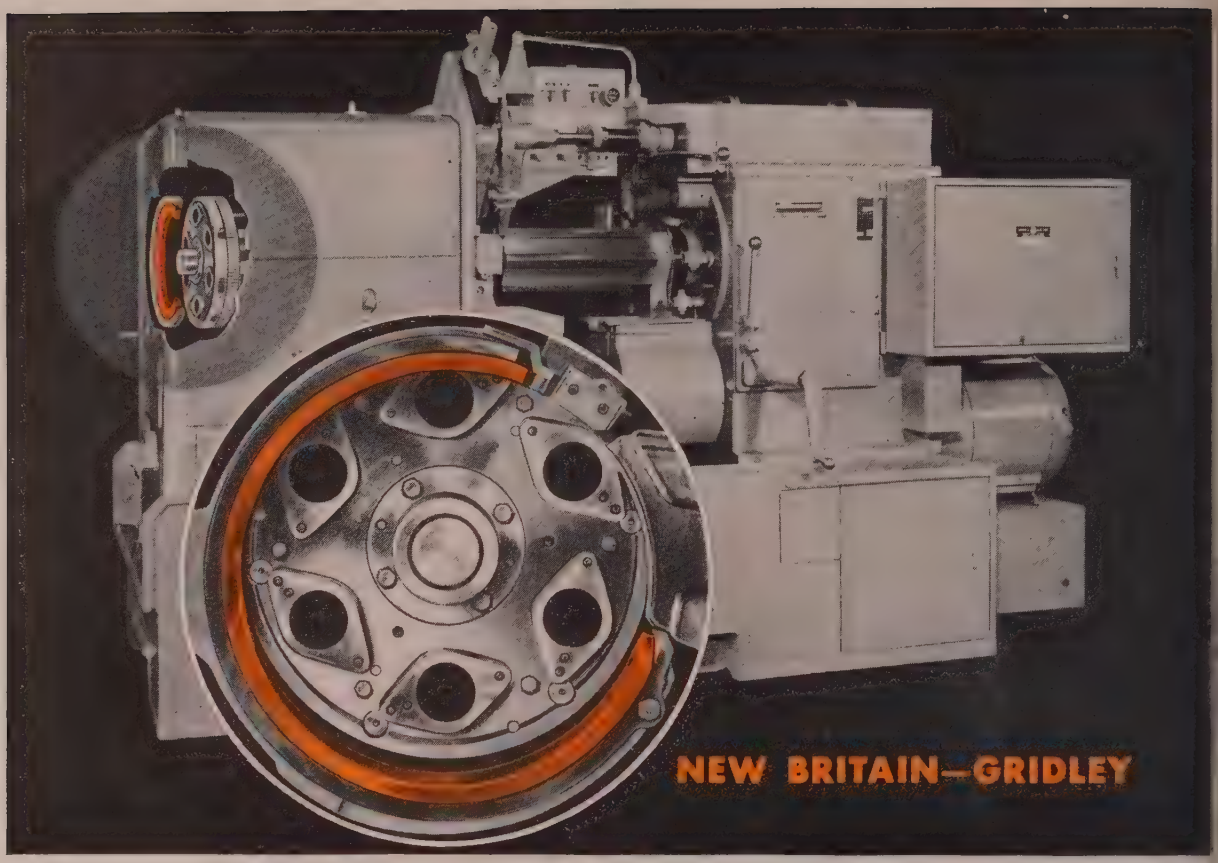
Whatever your pressure processing problem may be . . . it's a good idea to talk it over with an H-P-M engineer.

HPM

THE HYDRAULIC PRESS MFG. CO.

1044 Marion Road, Mount Gilead, Ohio, U. S. A.

Presses for Every Pressure Processing Application



CAST CENTRIFUGALLY for soundness and uniformity

And economy, too! N.B.D.'s ability to produce quality copper-base castings helps New Britain-Gridley keep permanent accuracy in its automatic screw machines.

This New Britain-Gridley six-spindle automatic screw machine is built to assure continuous production on the toughest jobs without the necessity of frequent adjustment or overhauling.

The function of the stock feed guard ring (shown above) made by National Bearing Division is to keep the six stock feed tubes in proper position while bar stock is being machined and the spindle carrier is being indexed. The stock feed tubes each have a spool which rides on the guard ring. Spindle speed on some machines reaches 2750 rpm. The spindles, indexed into six positions around the circumference of the ring, require close tolerances on the guard ring so that the bearing area will remain uniform.

National Bearing Division was entrusted with the production of this vital component because of its skill in producing centrifugal castings with high physical characteristics, in addition to the economies that could be realized through the purchase of a semi-machined part. National Bearing produces tool slide bushings for these same machines centrifugally cast to the same degree of accuracy and soundness.

If your product requires copper, bronze, or other copper-base castings, it will be worthwhile for you to investigate National Bearing Division. We produce copper-base castings, large or small, with any degree of finish, to precision specifications. And, because we are set up for production runs, we can probably save you dollars.

Write to National Bearing Division for complete information and your copy of our catalog.

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

4925 Manchester Avenue • St. Louis 10, Mo.

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

F&I Rebuilds Power Plant

Project is completed without a shutdown at Pueblo mill which is being expanded

MAMMOTH 100,000 pounds-per-our steam plant has been sliced ito sections, loaded on railroad ars in Coffeyville, Kans., and suc-essfully "transplanted" to the 'ueblo, Colo., steel mill of Colo-ado Fuel & Iron Corp., 500 miles -way.

The novel moving job was per-ormed in 17 weeks. The mill's team generating system was re-uilt without a shutdown.

Big steam boilers have to be es-ecially built for the job and it akes about a year to build one. CF&I engineers found one that ould be converted for use in the ueblo mill in a matter of weeks, o as to have ample power ready or the new seamless tube mill ow being rushed to completion.

Fall Schedule—Two new 100,000 pounds-per-hour boilers are being installed. All three boilers will be in operation by October.

Greatly increased steam capac-ity is required at CF&I's Pueblo mill because of the addition of ex-tensive steelmaking facilities, in-cluding the new seamless tube mill now under construction. First such mill to be built in the West, the new seamless tube plant will have an annual capacity of around 175,000 tons of seamless casing and tubing. The seamless mill and related facilites, estimated to cost about $30 million, will be centrally located with respect to many of the larger western and southwest-ern oil fields, as well as some of the new fields in the Rocky Moun-tain area that show considerable promise.

Test runs will begin in the new mill soon, A. F. Franz, president, indicates. Tube rounds are al-ready stockpiled in preparation for coming production.

Torrington Mfg. Co. Expands

Torrington Mfg. Co., Torring-ton, Conn., manufacturer of pro-peller fan blades, blower wheels, spring coiling machines and aux-iliary mill machinery, is erecting a $500,000 plant addition. This is the firm's 15th major expansion program since 1900.

Ferroalloy Plant Opened

Electro Metallurgical Co., New York, is operating its new plant in Alloy, W. Va. This plant doubles the company's capacity for producing medium-carbon fer-romanganese.

Gear Works Changes Name

Precision Machine Co., Milwau-kee, changed its corporate name to Precision Gears Inc.

Damascus Tube Names Agent

Damascus Tube Co., Greenville, Pa., manufacturer of stainless steel tubing, appointed Stanley B. Knapp Co., Atlanta, as its repre-sentative in the South.

Records Low Accident Rate

The steel industry had the fourth lowest accident frequency rate in 1952 among the 40 basic industry classifications, says Na-tional Safety Council, Chicago. Steel's rate was 4.07 (disabling injuries per 1 million man-hours), a drop of 10 per cent from 1951 and comparing with 8.40 for all industries. Its severity rate (time charges in days per 1000 man-hours) was relatively high at 1.16 compared with a rate of 0.88 for all industries.

Electrochemical Society Moves

Electrochemical Society Inc. moved to larger quarters at 216 W. 102nd St., New York.

Magnesium Foundry Cuts Output

Operations have been cut from three to two shifts and 100 work-ers laid off at the magnesium foundry of Aluminum Co. of America, Buffalo, principally be-cause of the order stretch-out in the aircraft industry. This is the first production drop at the plant in more than three years. Horace C. Cook, works manager, said that while the plant still has a substan-tial order backlog, many custom-ers have advanced delivery dates of magnesium castings. Most of the stretch-out has come from about six major producers of air-craft engines and parts. Most of the Buffalo plant's output is for the aircraft industry on a subcon-tract basis.

Coating Cuts Corrosion

Difference in corrosive-resistant abil-ity of the two rims in picture above is plainly seen. Both were subjected to a salt spray for 48 hours at a 95-de-gree temperature. Rim at left had re-ceived the Goodyear bond-A-coat treatment and is not affected by the salt. Its companion rim had received only the conventional galvanized finish

Boosts Cut Wire Shot Output

Cleveland Metal Abrasive Co., Cleveland, organized a facility for the production of cut wire shot. This plant, located on Northfield road, Northfield, O., will be known as the Cut Wire Division. It will double the firm's productive capac-ity of this abrasive material. The firm's range of metallic abrasives includes all types: Hard iron, mal-leable, cut wire and cast steel.

Miracle Products Leases Plant

Miracle Products Co. Ltd., To-ronto, Ont., newly formed subsid-iary of AP Parts Corp., Toledo, O., has leased a building containing 20,000 sq ft of floor space. Located on Clayson road adjacent to the Barrie highway, the premises will provide facilities for the initial manufacturing operations of the company in Canada. Equipment is being installed for the assembly

of automotive exhaust systems and will include a spray painting operation.

Copes-Vulcan Appoints Agent

Copes-Vulcan Division, Continental Foundry & Machine Co., Erie, Pa., appointed Hank Thurstin Co., Denver, as a representative for its product.

Ungar Electric Tools Moves

Ungar Electric Tools Inc., moved its offices to 4101 Redwood, Venice, Calif.

Hackney Steel Changes Hands

Hackney Steel Co., Birmingham fabricator of small parts, has been acquired by Andrew E. Moody and associates with a complete new set of stockholders. Mr. Moody says the company has tentative plans to step up output of the plant.

Schedules Personnel Course

National Industrial Conference Board, New York, will conduct a lecture-discussion course in "Introduction to Personnel Administration" from Oct. 26 to Nov. 6 at the Seaview Country Club, Absecon, N. J.

Builds Pipe Annealing Furnace

Rust Furnace Co., Pittsburgh, is constructing a continuous pipe annealing furnace for McWane Cast Iron Pipe Co., Birmingham. The new furnace will handle 2-in. and 3-in. diameter pipe and has a capacity of 15 tons an hour.

Stove Firms Consolidate

Odin Stove Mfg. Co., Erie, Pa., was purchased by Dearborn Stove Co., Chicago. The Odin plant will continue to be operated in Erie. D. O. Tomlin, president of Dearborn, says the purchase of Odin is part of the firm's expansion program in the appliance field.

Frederick-Sochor Mfg. Formed

Frederick-Sochor Mfg. Co. Inc., Endwell, N. Y., a new firm, will begin manufacture of machines, machine parts and tools in about two months. Capitalized at $75,000, the company is headed by Richard E. Frederick Sr., John F. Sochor and Ernest G. Sochor.

Cyril Bath Opens New Plant

Cyril Bath Co.—contour formers, power press brakes, dies, tools and special machinery—moved into its new plant at Aurora and Solon roads, Solon, O.

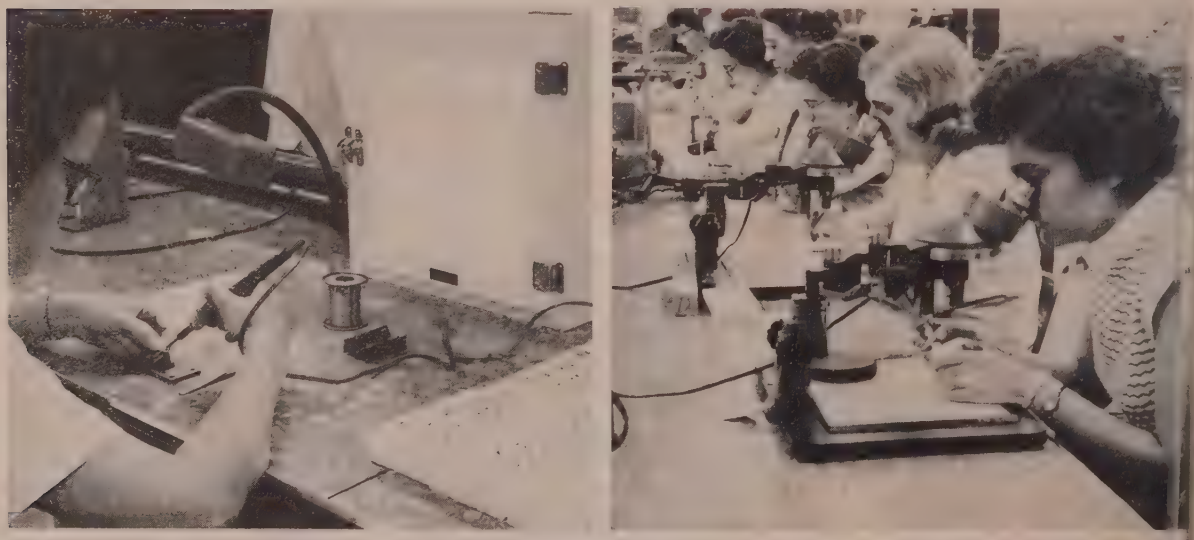
Zero Mfg. Co. Expanding

Zero Mfg. Co., Burbank, Calif., will build a plant addition to house $100,000 of metalworking machinery which the firm has purchased. Zero is engaged in precision sheet metal work and is a large manufacturer of precision deep-drawn boxes. Facilities and plant capacity have been doubled since Apr 1, 1952, when the firm was reorganized as a corporation.

Plans $1.2 Million Plant

A sum of $1.2 million has been designated for erection of a plant in Rochester, N. Y., for Consolidated Vacuum Corp., it was announced by Consolidated Engineering Corp., Pasadena, Calif., parent company. The new structure will have 96,000 sq ft of floor space and will provide room for expansion of current operations. The company will continue production in its present location pending completion of the new plant. Consolidated Engineering makes static and dynamic recording systems, mass spectrometers, leak detectors, electrical computers, recording o

(*Please Turn to Page* 88)



Research Leads to More Compact Electronic Equipment

Two new types of transistors, tiny crystal devices that promise to expand greatly in the field of electronics, have been developed by Sylvania Electric Products Inc., New York. Tetrode transistor has three wires in contact with the germanium crystal; the pentode has four. Worker, above left, solders a wafer of germanium to a triode transistor (two contact wires) mounting post. Workers, above right, using powerful microscopes, attach a silicate lead wire to a dot of the rare metal. Gallium is undergoing tests as a possible substitute for germanium

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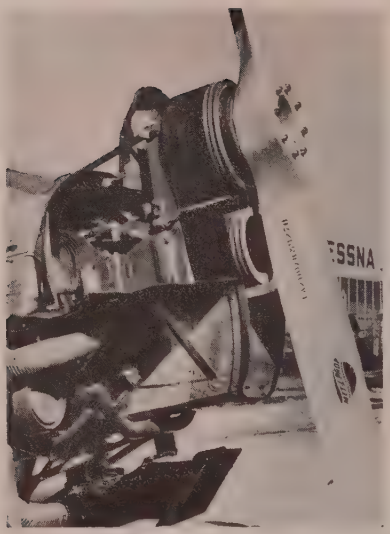


New V-Belt Drive

An unusual propeller V-belly-pulley drive, developed by Cessna Aircraft Co. and Goodyear Tire & Rubber Co. with co-operation of Continental Motors Corp. and McCauley Propeller Co., is shown in above close-up view. Testing has proved efficiency of the arrangement as well as reduction in engine noise and propeller vibration

(*Continued from Page* 86)

cillographs, and oscillograph analyzers.

Hartford Tool Moves Factory

Hartford Tool & Die Co. Inc. moved its office and factory to 500 Cottage Grove Rd., Bloomfield, Conn.

Ipsen Opens Branch Office

Ipsen Industries Inc., Rockford, Ill., manufacturer of automatic heat-treating equipment, opened a sales and service branch at 3400 Tudor St., Philadelphia.

Worthington To Expand Plant

Worthington Corp., Harrison, N. J., will expand and modernize its Plainfield, N. J., Works. Within the next nine months, the corporation expects to spend well over $1 million to increase by one-third its production of construction equipment, positioning machines and industrial mixers. By 1954, Worthington will have completely modernized and relocated its machine shop, spending about $250,000 on machine tools alone, says K. W. Horsman, manager.

Porter Acquires Wire Rope Firm

H. K. Porter Co. Inc., Pittsburgh, acquired a controlling interest in A. Leschen & Sons Rope Co., St. Louis, producer of wire rope. Operations will continue as Leschen Wire Rope Co., a division of H. K. Porter Co. Inc., under the direction of D. W. Vernon, vice president and general manager. A. A. Leschen, former president, plans to retire from active business.

Allied Chain Opens Warehouse

Allied Chain Link Fence Co., Houston, opened a southeastern warehouse and regional sales office in Birmingham.

Instrument Firm Builds Plant

American Instrument Co. Inc., Silver Spring, Md., completed construction of a 40,000-sq ft branch plant at Savage, Md., and expects to get into production this month. The company specializes in laboratory and scientific instruments. William H. Reynolds is president.

Cleveland Firm Names Agents

Protective Coatings Inc., Cleveland, has retained Alan E. Bodycombe, Detroit, to represent the firm in Michigan; J. Whitney Cooper, Rochester, N. Y., in upper New York state; and H. L. Showalter Jr., Chambersburg, Pa., in much of the middle Atlantic states. Protective Coatings is a marketer and application engineer for a selected range of coatings, including those produced by R. M. Hollingshead Corp., Camden, N. J., and Gates Engineering Co., New Castle, Del.

Camley Enters World Trade

Based upon reactivation of a former network of representatives in ten nations, Camley International Co. entered into world trade with offices in Los Angeles. Buying for its own account and as export representatives, the firm will market industrial engineering equipment from its office in this country; London; Rio de Janeiro and Porto Allegre, Brazil; Lima, Peru; Buenos Aires, Argentina; Kingston, Jamaica, British West Indies; Karachi, Pakistan; New Delhi and Calcutta, India; Halsingborg, Sweden. Offices in Australia, South Africa and Israel will be announced at a later date. Norman H. Lee is president.

Makes New Magnet Material

Carboloy Department of General Electric Co., Detroit, has been licensed by Philips Laboratories Inc. to manufacture a new magnet material composed essentially of barium-oxide-iron oxide. No material will be available during 1953, but a research program will be conducted to develop further the new magnetic material which has properties approaching those of alnico. Chief advantage, the company says, is the lack of strategic materials in its composition. Possible applications for the new material are in the TV and radio field, dynamos and motors.

Oliver United Shifts Personnel

Oliver United Filters Inc., New York, is locating Thomas C. Reeves in Asheville, N. C., to serve the chemical and general industrial fields in the southeastern part of the country. The firm transferred G. T. Tersaga from research development to sales engineering; Andrew Tait from sales development to sales in the New York office.

Bendix Transfers Operations

Total production of the Utica, N. Y., plant of Bendix Aviation Corp. will be channeled gradually into the aircraft accessories field. During the next six months, production facilities will be modified in accordance with the new plan. Some of the machinery in Utica will be shipped to Bendix divisions and new machinery will be sent to the Utica plant.

Observes 20th Anniversary

Lee Wilson Engineering Co. Inc., Cleveland, is celebrating the 20th anniversary of its founding. Lee Wilson, board chairman, invented the radiant tube annealing system now used in eve-

(*Please Turn to Page* 91)

Microhoning

REDUCES COST

SIMPLIFIES PROCESSING

IMPROVES ACCURACY...

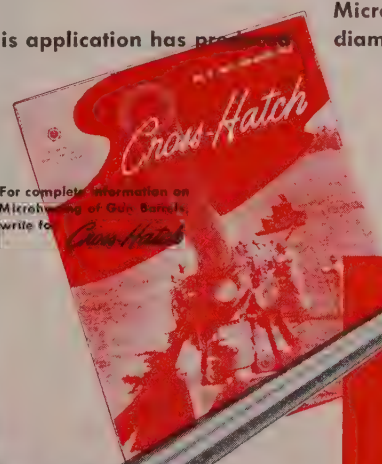
of 280 mm
atomic gun barrel

Chosen over other methods, the Microhoning process is being used to generate the inside surface of the new 280 mm atomic gun barrel!

Microhoning . . . corrects all inaccuracies left by previous operations and generates a round, straight bore . . . eliminates several processing operations formerly required to obtain the necessary accuracy . . . facilitates broaching of the rifling by providing a true piloting diameter . . . assures a superior seal between the barrel and the projectile.

Constant improvement in this application has produced a Microhoning tool with a gage built into its nose, simplifying diameter checking and cutting 4/5 off the former Microhoning time!

This is another example of how Micromatic is continually developing new and better equipment for Microhoning all types of surfaces regardless of length, diameter, or material.



For complete information on Microhoning of Gun Barrels, write to Cross-Hatch

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Quick-connective couplings are their business—

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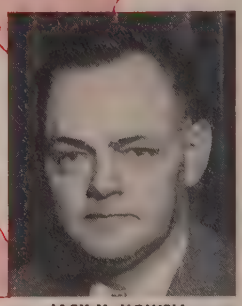
REPRESENTATIVES

To provide quickly available assistance on pneumatic and hydraulic problems, we have recently appointed additional Hansen representatives in the Eastern area. Like all other Hansen representatives, these men are trained specialists who have had years of experience in close contact with fluid line circuits in hundreds of plants.

If you aren't already making use of his know-how, call the Hansen man in your area the next time you run into difficulties. Frequently he can make suggestions to give you vastly improved performance from your present fluid line installation.

KENNETH E. KNOTTS
K. E. Knotts Co., Newark
Has previously served as director of sales for leading manufacturers of fluid line control equipment.

J. A. MOODY
J. A. Moody Co., Philadelphia
Equipped with a thorough background of pneumatics experience in both the manufacture and installation of fluid line accessories.



JACK M. HOWELL
Jack M. Howell Co., Baltimore
Now serving the Mid-Eastern Seaboard area. Offers technical know-how acquired from years of experience in the selection and use of pneumatic and hydraulic equipment.

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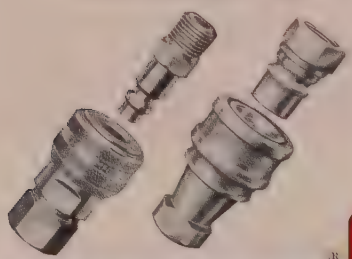

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(*Continued from Page* 88)

ıding steelmaking center of the ›rld. Latest addition to this ex-nding company is an assembly ant in Elyria, O., which turns t furnaces completely assem-ed for shipment.

enn Metal Builds Addition

Penn Metal Co. Inc., Parkers-ırg, W. Va., is building an addi-on to its plant. This is the fourth ddition to the plant within the ast three years. The company akes metal lath and plastering ccessories, expanded metal and new line of light steel struc-ıral sections.

onducts Canadian Exploration

Canadian-Cliffs Ltd., a wholly-wned subsidiary of Cleveland-liffs Iron Co., Cleveland, is con-inuing a broad program of ex-loration in Canada. This pro-ram was instituted in 1952 and s expected to continue, and prob-bly expand, in the future. The ompany is primarily concerned vith iron ore and related ferro-lloy minerals. The program is be-ng conducted in Ontario, Quebec nd the maritimes on crown lands nd lands personally held by indi-viduals and exploration compan-es.

Columbia Container Expands

Columbia Container Corp., Balti-more, manufacturer of corrugated containers and die cut specialties, is building an addition to its branch plant at 2240 Annapolis Ave., that city. James E. Glose is president.

Enlarging Extrusion Plant

Kaiser Aluminum & Chemical Corp., Oakland, Calif., completed foundation work on an addition to its aluminum extrusion plant at Halethorpe, Md., and is expected to let the contract shortly for the superstructure, which will comprise 320,000 sq ft. Company originally intended to house two 8000-ton capacity extrusion presses; however, the government recently withdrew permission for the installation of one of the two presses.

Kold-Hold Mfg. Changes Name

Kold-Hold Mfg. Co., Lansing, Mich., changed its corporate name to Tranter Mfg. Inc. The firm established four divisions: Kold-Hold, commercial and truck refrigeration; Platecoil, process heating; Contract, refrigeration and heating; Defense, prime and subcontract work.

Ore Moves Faster

INLAND STEEL CO., Chicago, completed a three-year program of repowering and lengthening the ore boats in its fleet when the carrier *Philip D. Block* left Chicago July 15 en route to the upper Great Lakes on its first ore-carrying run of the season.

With the sailing of the *Block,* which has been in the South Chicago yards of American Shipbuilding Co. since last fall, all of Inland's vessels were back in operation. In terms of iron ore tonnage, the repowering program has added about 135,000 tons per year to the capacity of Inland's fleet. Preliminary estimates indicate that the *Block's* new engines will provide the vessel a 20 per cent increase in speed, probably cutting 15 hours from the average round trip time and permitting about five additional trips per season.

Lee C. Moore Corp. Moves

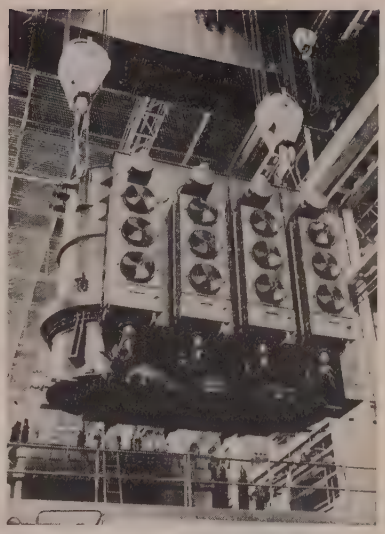
Lee C. Moore Corp. moved its office to Gateway Center, Suite 624, 140 Stanwix St., Pittsburgh 22.

Orton Crane Names Agent

Orton Crane & Shovel Co., Chicago, appointed Industrial Handling Associates, Cleveland, as its agent.

Offers Air Compressor Service

A unique, nation-wide plan to save users of air compressors the high costs and operating losses resulting from sudden failure of their air compressor equipment is announced by Air Compressors & Motors Inc., Cleveland. The firm offers stand-by replacement equipment, promptly installed on a short-term rental basis for the period required to repair or replace the original equipment.



GE Ships Transformer

A 140-ton transformer is shown being readied at GE's Pittsfield, Mass., plant for shipment to Arkansas. Two of these units will handle enough power to serve individual needs of nearly 1 million persons, or more than half of the population of the state

Pacific Airmotive Gets Agency

Pacific Airmotive Corp., Burbank, Calif., was appointed exclusive distributor in this country for aircraft turbo refrigeration equipment, cabin superchargers, aircraft fans, water separators, aircraft silencers and ground air-conditioners, manufactured by Sir George Godfrey & Partners Ltd. of England and its subsidiary, Godfrey Engineering Co. Ltd. of Canada.

Murray Corp. Buys Eljer Co.

Murray Corp. of America, Detroit, purchased Eljer Co., Ford City, Pa., manufacturer of plumbing fixtures. Eljer will be operated as a Murray subsidiary. Acquisition of this firm, together with the recent purchase of Triplex Co., Cleveland, added to Murray's

(*Please Turn to Page* 94)

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You get UNBIASED COUNSEL based on all abrasive methods

Your business, in mass production of parts or finished assemblies, is the problem of generating close tolerance sizes, of producing high surface finishes, of removing stock. The business of CARBORUNDUM is the exclusive ability to recommend and furnish you the specific type of abrasive product which will give you highest quality at lowest cost, on every operation you perform.

Take snagging, for instance. With abrasives there are at least 9 different ways to remove stock at high rates. That means the odds are 9 to 1 there's a better, lower cost way than the one you're using now. How can you be *sure?* By asking CARBORUNDUM...for CARBORUNDUM alone has a complete, branded line of grinding wheels *and* abrasive belts *and* tumbling and polishing grains...and only CARBORUNDUM can recommend without bias, on the sole basis of what's best for you.

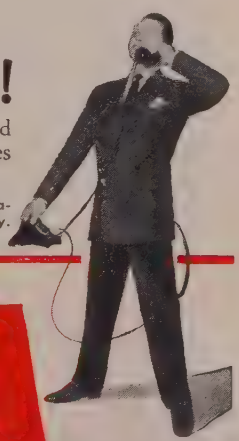
Or suppose you're manufacturing shears... you must remove scale with tumbling nuggets—finish with abrasive belts—sharpen with grinding wheels—polish with abrasive grain. CARBORUNDUM alone can give you *one-source control* of abrasive quality, on every type of abrasive you use...quality that's constant, identical, dependable—thus economical.

Several ways to do one operation? Call in CARBORUNDUM. Several processes on one part? Call in CARBORUNDUM. Either way, you win.

Call your CARBORUNDUM *Salesman or Distributor* today!

He's your best bet for complete stocks, prompt delivery...and best of all, experienced counsel on *every* new development in the *entire* field of abrasives. He's in the yellow pages under "Abrasives" or "Grinding Wheels." Phone him today—it's to your profit!

Ready now—your free copy of the new big COATED ABRASIVE SELECTOR catalog...containing detailed recommendations for both machine and hand sanding operations on tough and soft metals, glass, plastic, wood. Phone for it today.



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"Why do we use American Chain?"

"For two reasons," said this manufacturer of heavy machinery. "First, we have used American Chain successfully for years. Second, the high strength alloy it is made from permits using smaller diameter chain which is hooked up easily by our men. And the men like the way the grab hooks slip over the links and set themselves securely. I think they just feel safer working with American Chain."

This AMERICAN CHAIN user is referring to our 125 Endweldur, alloy steel, heat-treated ACCO Registered sling chain with our series 40 drop-forged grab hooks.

No matter what chains you require, AMERICAN has them and will furnish chains that will last longer . . . and cost less to use. Call your AMERICAN CHAIN distributor today and let him make recommendations. Or write to our York office for Bulletin DH-314.

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American Chain

(*Concluded from Page* 91)

present automotive, aircraft, plumbing fixture and appliance business makes it possible for the corporation to attain an immediate sales volume upwards of $150 million, says Byron C. Gould, president.

Horton Bristol Liquidating

Horton Bristol Mfg. Co. and Horton Bristol Sales Corp., Bristol, Conn., are permanently closed and in the process of liquidation.

Commemorates Furnaces

TWO OLD STONE blast furnaces, built in 1839 and 1843, respectively, and operated by Brady's Bend Iron Co., Brady's Bend, Pa., will be monumented as a park site.

The stacks were among the first to use coke as fuel and supplied iron for rolling into T-rails in a nearby mill. Some of these rails, laid around 1870 on the Conemaugh Division of the Pennsylvania Railroad, recently were removed for preservation.

Industrial Tectonics Expands

Industrial Tectonics Inc., Ann Arbor, Mich., has doubled the size of its plant. The firm makes precision balls of all materials in standard and special sizes.

Kurt Orban Named Distributor

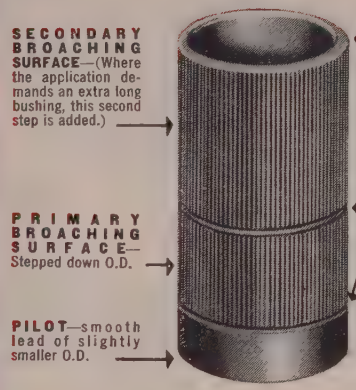
Kurt Orban Co. Inc., New York, was appointed exclusive American distributor for the complete line of German-made Wafios wire-forming, wire-netting, spring-making and nail-making machinery.

Josam Buys Canadian Factory

Josam Canada Ltd., subsidiary of Josam Mfg. Co., Michigan City, Ind., purchased a building in Toronto, Ont. The company plans to carry out complete machining of plumbing drainage equipment.

eliminate

CLOSE BORING TOLERANCES


SECONDARY BROACHING SURFACE—(Where the application demands an extra long bushing, this second step is added.)
PRIMARY BROACHING SURFACE—Stepped down O.D.
PILOT—smooth lead of slightly smaller O.D.
THIN WALL CONSTRUCTION—reduces weight, permits closer spacing.
CHIP RETAINER GROOVES—sized to handle all excess displaced metal.
Aeroquip Bushings are made of HARDENED STEEL and treated with BLACK OXIDE PENETRATE to prevent rust and corrosion.

with new AEROQUIP BUSHINGS

"the bushing with the broach"

Aeroquip knocks the "H" out of H.C.B. (High Cost Boring) with inexpensive Broach-Fit Bushings. Accurate results are assured with low cost reaming of tolerances up to .002". Even unskilled personnel can install them, thanks to these unique features: A SERRATED OUTER SURFACE that forms dozens of knife-like edges and permits the bushing to actually *cut* its way into plastics, cast metal, or other metal parts without danger of collapse or cracking. A PILOT that squares the bushing with the hole to prevent cocking. CHIP RETAINER GROOVES that gather displaced metal and help lock the bushing firmly into position. Aeroquip Broach-Fit Bushings cost so little that you can use them in many places where conventional types prove too expensive. A wide range of sizes is available, please write for complete information.

Aeroquip

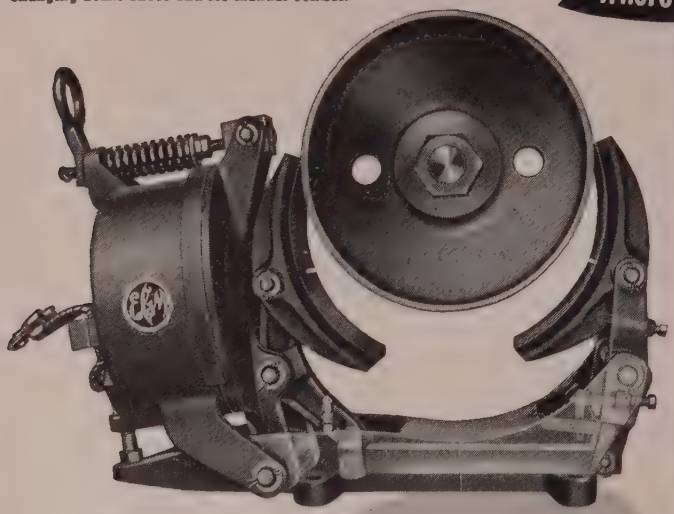
REG TRADE MARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

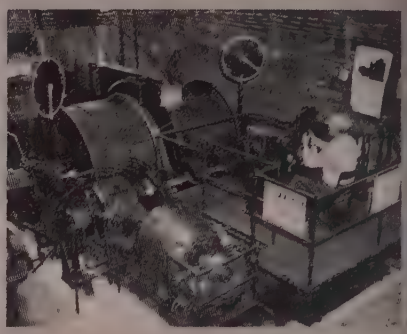
SALES OFFICES: BURBANK, CALIF. • DAYTON, OHIO • HAGERSTOWN, MD. • HIGH POINT, N. C. • MIAMI SPRINGS, FLA. • MINNEAPOLIS, MINN. • PORTLAND, ORE. • WICHITA, KAN. • TORONTO, CANADA

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

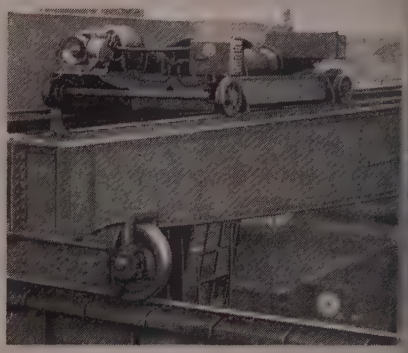
Type WB Brake showing how the motor armature is easily lifted out. At top left is the handle-nut for compressing the spring when removing motor armature, changing brake shoes and for manual control.



Where You Will SAVE With WB Brakes



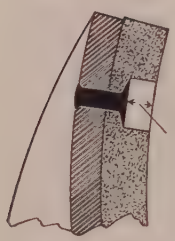
A-C Mine-Hoist Motor with WB Brake



Reduces Delays on Foundry Crane

Long Life Brakes for A-C and D-C Motors by EC&M

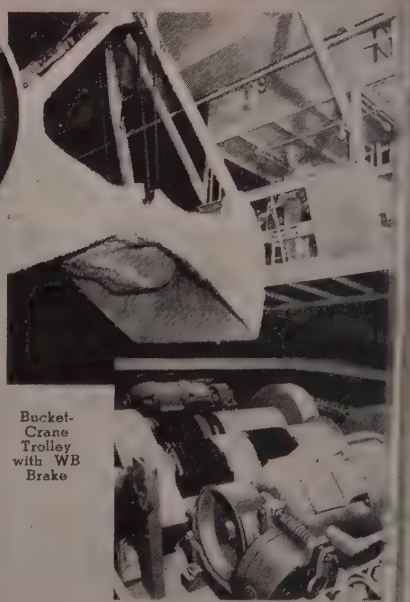
The brake lining is molded to match curvature of wheel and shoe.



Actual wearing thickness, between rivet heads and brake wheel, is 1/8" on the smallest size to 7/16" on the largest size.

These Type WB Brakes use a block type lining which is both thick and tough.

Furthermore, due to the process of manufacture, the blocks have proper frictional quality *throughout the entire thickness* permitting uniform and complete wear down to rivet heads. And since the material is non-compressionable, brake adjustments are infrequent.



Bucket-Crane Trolley with WB Brake

WRITE FOR COMPLETE FACTS—As for No. 18 ACCELERATOR Bulleti

THE ELECTRIC CONTROLLER & MFG. CO

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Technical Outlook

MAGNETIC AMPLIFIERS— An even rosier future for the magnetic amplifier regulating system was predicted by Westinghouse Electric engineers at a symposium meeting in New York last week. While the system can replace electronic or rotating regulators in almost every job, first-cost comparisons have admittedly slowed acceptance in some applications. According to Westinghouse, increasing volume-production of reactor core materials and low-leakage selenium rectifiers will bring the price down to where the maintenance-free advantage of the magnetic amplifier will more than cancel out the price difference.

AUTOMATIC THERMOMETER— Radiamatic pyrometers take temperatures of uranium ingots and bars being rolled at Birdsboro Steel Foundry & Machine Co., Fernald, O. Information is relayed to electronic recording instruments monitored by single operator. Robot system, product of Minneapolis-Honeywell Regulator Co., Minneapolis, is said to be 10 times faster and 2 to 5 times more accurate than crayon test.

ABRASION TIP— When selecting steel for resisting abrasion, consider amount of carbon in iron. That's the advice of Battelle Memorial Institute, Columbus, Ohio. Study of failures in wire rope used by Navy aircraft carriers to arrest landing planes showed high-pressure abrasion transformed thin surface layers to martensite. Carbon is an important factor in its formation. To avoid this type of embrittlement, Battelle suggests the use of ferritic alloy steels, such as SAE 52100.

OUT OF HOCK— Allis Chalmers says that the betatron installation at its plant paid for itself the first six months it was used. Raw forgings and castings are passed through the $315,000 test station to inspect for flaws and defects. This does away with investment of processing time in faulty parts. Also, it gives assurance that good parts are really good. Vital statistics: X-ray inspection with 22 million v will find flaws as small as $\frac{1}{8}$-inch deep or 0.002-inch wide in steel 12 inches thick or more.

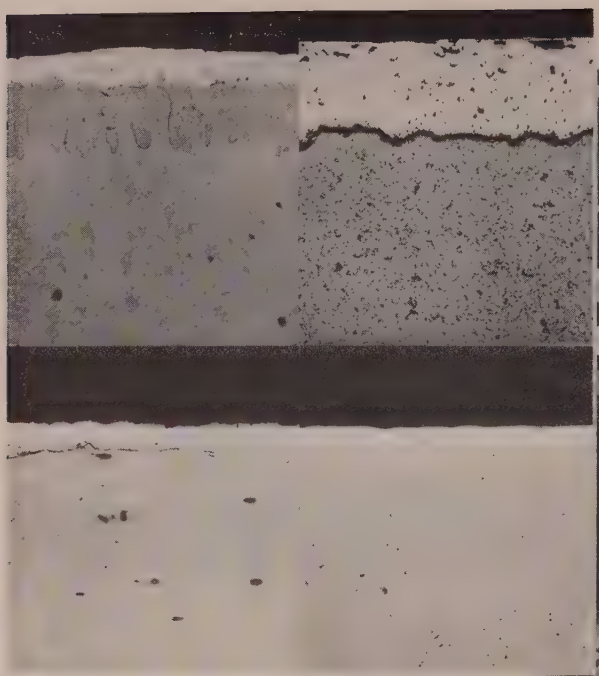
BIG SQUEEZE— Scrap baling press recently built by D&J Co. Inc., Buffalo, N.Y., will accommodate a modern auto, including its frame, plus additional sheet metal. Resulting package is 2 feet square x 5 feet long. Weight is about 1 ton.

TROUBLE SHOOTING— Enclosed in one end of the 200 mail carriers used in the pneumatic tube system interconnecting the 40-acre plant and offices of Carborundum Co. is an absorbent paper disk that has been soaked in a dilute solution of radioactive cobalt. When a carrier becomes jammed, maintenance man has only to run a Geiger counter along outside of the tube to pinpoint source of trouble.

WELDING TIP— King of high-temperature organics has taken on a new field. Silicone weld-backing materials, they're similar to paint in appearance and application, promote uniform penetration and eliminate harmful effects of air on underside of welds.

WHAT'S ON THE INSIDE— Aluminum coatings applied to steel for corrosion protection is attracting a lot of interest. So far several techniques have evolved for various applications, and this first installment of a two-part story evaluates them on p. 98. . . According to the experts, nickel never will climb completely out of the present shortage era. We're told the situation isn't too alarming, and why on p. 134. . . Interested in roller hearth annealing? Description of just about the biggest plate treating furnace is on p. 124. . . There's also a clever idea for easy welding of steel vessels written up on p. 140. . . And, of course, some other thought-provokers are interspersed.

Metalworking Outlook—p. 41 Market Outlook—p. 143



Strip of cold-rolled steel is coated with aluminum by the continuous hot dip process that is employed by Armco

Fig. 1—Upper left: Hot dip coating shows interfacial layer of iron-aluminum compound. Upper right: Sprayed high-purity aluminum coat. Lower left: Electroplated aluminum coat shows the absence of interfacial layer. Lower right: Clad coating applied by rolling and annealing

USE THE RIGHT PROCESS

For Coating Steel With Aluminum

Several methods are used to coat steel with aluminum for corrosion and heat resistance. The choice depends on purpose of coating and type of part

Part 1

STEEL IS COATED with aluminum to produce a noncorrodible and nonscaling surface. This is possible because aluminum gives galvanic protection to iron in the same manner as zinc. Aluminum coated steel has high resistance to rusting in industrial and sea coast atmospheres. Aluminum coatings also markedly decrease oxidation at high temperatures.

Adapted from Aluminum in Iron and Steel, by Samuel L. Chase and Kent R. Van Horn, just published by John Wiley & Sons Inc., New York

Although the choice among various methods of coating steel with aluminum is determined by economic and performance considerations, the general use of aluminum coatings on steel products is rapidly expanding and technological developments in coating processes give additional impetus to a wider use of these products.

Rules To Follow—As a general criterion, when the purpose of the aluminum coating is for protection against atmospheric corrosion, a surface layer of pure aluminum is desirable. On the other hand, when the major coating objective is improved resistance to scaling, the iron-aluminum compound is more effective than a pure aluminum coating.

Since iron begins to form compounds with aluminum at 900 F, even a sprayed or electroplated coating which has no compound layer at the time of application will form a progressively increasing alloy layer when annealed or subjected to service at temperatures above 900°F.

Here They Are — The various processes for coating steel with aluminum employ, singly or in combination, the following principal methods: Calorizing or some similar treatment involving dif-

Scale resistance of calorized steel observed under comparable high-temperature service conditions. At left: Plain mild steel pot. At right: A calorized pressed steel pot

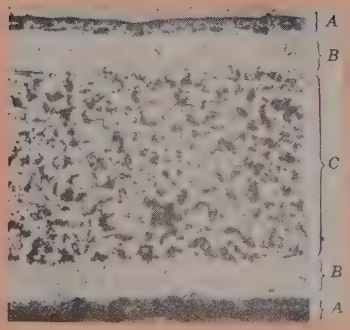


Fig. 2—Microstructure of calorized mild steel. A: Outer layer of alumina; B: Solid solution zone of the aluminum-iron phase. C: Base metal X500

ion; plating from a vapor phase f aluminum chloride; metal spraying; electroplating; cladding; casting; and hot dipping.

In electroplated, vapor-plated, or sprayed coatings which are not subjected to annealing treatments, the coating consists of a somewhat porous pure aluminum layer. All other coating processes, except cladding, result in a surface layer of pure aluminum bonded to the steel base by a zone of iron-aluminum compound. The thickness of the compound layer depends on the temperature of the process and the duration. If the temperature is sufficiently high, the pure aluminum zone may disappear entirely. This will result in a homogeneous layer of iron-aluminum compound.

Look At Costs—So far as economics of the various processes are concerned, calorizing and hot-dip processes are more applicable to large-scale production because these methods require fairly expensive installations. On the contrary, spray-coating processes, although often more costly per unit of covered area than other procedures, require a minimum of equipment and can be readily utilized on intermittent production work. By annealing, sprayed coatings can be changed structurally to approach calorized coatings.

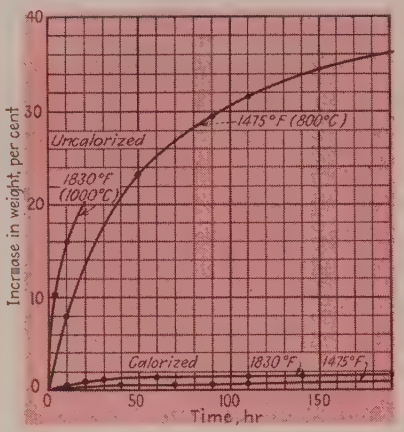
In Table I, the various coating processes are rated on the basis of thickness of alloy layer, continuity of coating, and cost. Coating thicknesses listed in this table represent ranges obtained from actual measurements on numerous samples. The cost evaluation gives highest rating to hot-dip processes, the lowest to spraying. For irregular shapes, any one of the processes except cladding is applicable to a varying degree. But for commercial coating of steel sheets, strip or wire, the hot-dipping process is the one most commonly employed.

Interfacial Compounds—A problem common to nearly all aluminum coating processes is control of iron-aluminum compound layers that form either during the coating operation or during subsequent thermal treatments. This compound zone may consist of several intermediate phases which appear, however, as a single zone in the microstructure. Being brittle, the iron-aluminum layer impairs the ductility of the coating in bending and other cold-forming operations. It may also have an adverse effect upon adherence of the coating and thus decrease resistance of the metal to scaling. An iron-aluminum compound is not desired in the surface layer of the coating when protection against corrosion is the primary purpose of the aluminum coating.

Iron-aluminum compounds originate whenever steel is heated in contact with aluminum at tem-

These aluminum structural members of Missouri Pacific Railroad are being metallized with pure aluminum to guard against loss of strength due to corrosion

Fig. 3 — Effect of calorizing on steel scaling at various temperatures



COMPARISON OF PROCESSES FOR ALUMINUM COATING OF STEEL

Rating of 1 indicates best classification

Process	Thickness of coating, mils	Absence of interfacial layer	Continuity of aluminum coating	Cost rating
Hot dipping	0.5 - 3.0	2	2	1
Cladding	0.4 - 5.0	3	1	2
Electroplating	0.1 - 2.0	1	3	3
Spraying	2.0 -20.0	1	4	4
Chemical reaction	0.05- 0.1	4		3
Calorizing†	10.0 -40.0	4		3

† Includes all coatings that are heat treated for impregnation.

peratures above 900°F. Coating thickness increases with increasing contact time. Although iron-aluminum compounds do not form when the coating is produced by electroplating or spraying, subsequent annealing of the coated steel will result in formation of an interfacial brittle compound layer.

Microstructure of typical aluminum coatings obtained by hot dipping, spraying, electroplating, and cladding is illustrated in Fig. 1. The electroplated, sprayed, and clad coatings show no interfacial compound layers, but in the hot-dipped coating the compound is fairly uniform in thickness.

A 15-minute anneal at 1400°F completely converts a two-phase hot-dip coating into an iron-aluminum compound. If the hot-dip process is used at a sufficiently high temperature, the coating will consist entirely of an iron-aluminum compound. This type of coating, obtained either by hot dipping at high temperatures or by heat-treating other types of aluminum coatings, seems to enhance resistance to scaling, but has a deleterious effect on resistance to atmospheric corrosion.

Powder Packing—This was one of the first processes employed for coating steel with aluminum. It is known by the trade name Calorizing.

The original Calorizing method was developed by General Electric Co. as a proprietary process. Many variations of it have since been developed and methods in use today are modifications and improvements of that process. As a general practice, steel surface is cleaned of scale by sandblasting. Articles are then sealed in air-tight retorts partly filled with a calorizing powder and heated for several hours to a temperature of 1550-1700°F. Ingredients of the calorizing powder are metallic aluminum, alumina (to prevent metallic grains from fusing), and a small amount of ammonium chloride, zinc and graphite. Most common mixture is 49 per cent aluminum powder, 49 per cent alumina and 2 per cent ammonium chloride, but proportions may vary considerably. Calorizing powder is reused with occasional replenishment of the metallic aluminum when the latter has decreased below 35 per cent of the whole.

Keep Out Air—Access of air to the calorizing container must be prevented. Sometimes this is achieved by using a hydrogen atmosphere; alternatively, the retort may be equipped with valves that allow gases to escape but do not permit entrance of air. Vaporized ammonium chloride is expected to force the air from the retort during the heating stage.

After 4 to 6 hours at 1550 to 1700°F, the impregnated coating may be 0.001 to 0.006-inch thick, depending on composition of the steel. Chromium, as an example, appreciably retards the diffusion of aluminum. Additional heating for 12 to 48 hours at 1500 to 1800°F after removal of the part from the retort will increase the diffusion depth to 0.025 to 0.040-inch and will reduce the aluminum content of the coating to about 25 per cent. This, it is claimed, materially improves the toughness and ductility of the coating. In German practice, the calorizing powder may contain grindings from aluminum wastes and alumina without adding ammonium chloride, zinc, or similar intensifiers.

Structure—Fig. 2 illustrates a typical structure of calorized mild steel. It shows an outer layer of alumina (A) formed by oxidation of the aluminum rich surface; a delta solid solution zone of an aluminum-iron phase (B); and the unaffected base metal (C).

The firmly adherent envelope of alumina is sufficiently cohesive in texture to reduce further oxidation. The alloyed zone B retards outward diffusion of iron from the base metal, which has been observed in heating calorized steel for different periods of time at varying temperatures.

Diffusion of aluminum into the ferrite, which occurs during the calorizing treatment, results in the initial formation of an iron-aluminum intermediate phase, $FeAl_3$. This compound may be formed in varying thicknesses, depending on time and temperature of treatment. It therefore appears that during the first stage of the

process the diffusion is predominantly an inflow of aluminum into the base metal.

On removal of the articles from the retort, the treated part has an outer layer of the compound $FeAl_3$ and an inner zone of unaltered steel. Upon subsequent heating, the mechanism of diffusion seems to change. For a time, diffusion of aluminum inward and of iron outward takes place until the compound $FeAl_3$ is converted into the delta solid solution, which under high-temperature service conditions will form a protective film of Al_2O_3.

Reduced — After formation of the delta solid solution, rate of diffusion is greatly reduced. At temperatures below 1740°F, it is so slow that service obtained from calorized steel is many times that obtainable from untreated steel.

Typical results showing the comparative scaling of calorized and untreated steels at 1475 and 1830°F are presented in Fig. 3. They indicate that after 190 hours at these temperatures, calorized samples were practically unaffected, whereas for untreated specimens the increase in weight resulting from scaling at 1475°F approached 36 per cent. At 1830°F, the increase in weight of uncoated mild steel was 20 per cent after only a 20-hour exposure, when the tests were discontinued.

Calorized steel and cast iron articles may be advantageously employed at temperatures up to 1750°F. Above this temperature mild steel is not suitable as a base because the accelerated rate of outward diffusion of iron into the coating causes a comparatively rapid breakdown. For higher temperatures it is necessary to use heat-resisting steels. Another important advantage of the calorizing treatment is the relative immunity of aluminum coated steel to sulphurous gases.

Fabrication—Cold fabrication of calorized steel is not practicable because the coating will generally crack when elongation exceeds 5 per cent. Bending and forming, if any, must be performed at a bright red heat, but even under such conditions cracking may occur unless the bending radii are liberal.

Calorized steel and iron parts are used to advantage in the following typical applications:

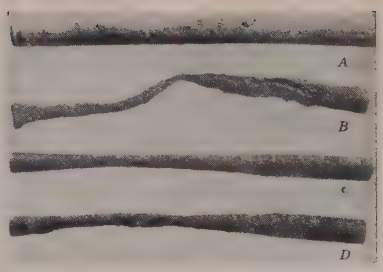
1. In the heat-treating of metals: Case-hardening boxes, annealing pans and trays, conveyor chains, door frames of furnaces, baffle plates, dampers, as chutes, etc.

2. In ore-roasting furnaces: Firing nozzles, lifters and other internal fittings, which may be severely attacked by sulphurous fumes.

3. Miscellaneous parts, such as muffles, heat-exchange apparatus, etc.

Calorizing is also beneficial in extending the life of heat-resisting nickel-chromium-iron alloys which are not generally suitable for service in sulphur-bearing atmospheres because of the high affinity of nickel for sulphur.

Aluminum Chloride—This process is based on a chemical plating action that occurs when aluminum chloride contacts a clean steel surface at a temperature of 1700°F. The Martin process, based on this reaction, has not received wide commercial acceptance because thickness of deposited coating is not sufficient to provide any appreciable protection against corrosion or oxidation at high temperatures.



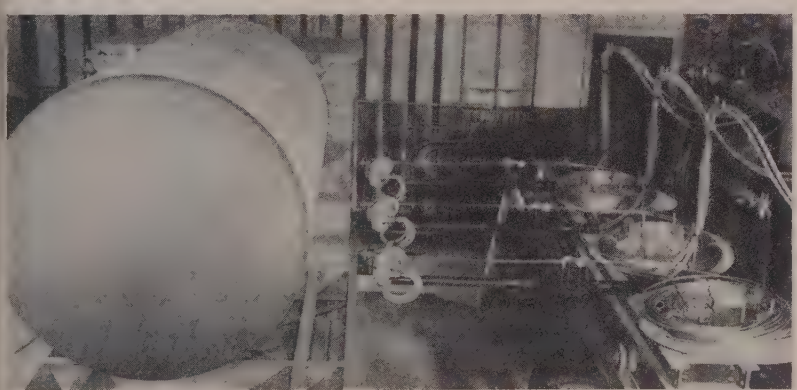
Calorized (A) and uncoated (B,C,D) chromium-nickel-iron wire exposed to temperature of 2100°F for 520 hours

Spraying—In this process, an aluminum coating is applied to a thoroughly cleaned and roughened surface by a spray gun. The most commonly used spray gun is a wire gun; more rarely, a powder gun is employed. With the wire gun, aluminum wire is fed into an oxyacetylene or an oxyhydrogen flame by means of an air-driven turbine of variable speed. Wire moves at a speed just sufficient to permit uninterrupted melting and atomization of the aluminum by an air blast at a pressure of 50 to 60 psi. With the powder gun, aluminum powder is forced into the flame by suction produced in the gun's nozzle.

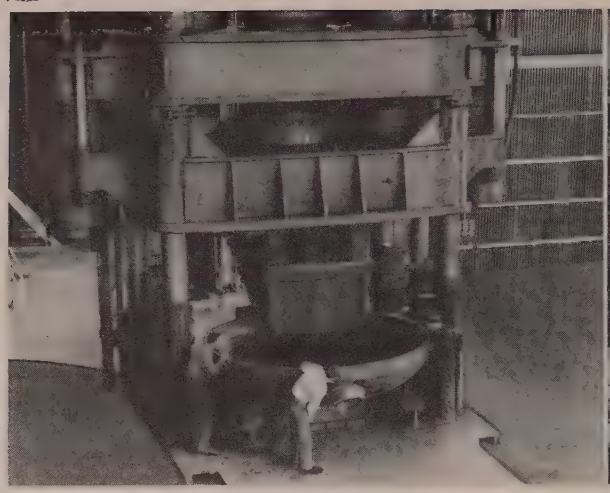
Steel surface is generally prepared by pickling and sand or grit blasting to insure good adhesion. Sprayed aluminum coating adheres mechanically: There is no alloy bond with the steel base because of rapid cooling of atomized aluminum particles.

To improve coating adherence, sprayed articles are generally given a diffusion anneal for up to 5 hours at 1550 to 1850°F; for some coatings, 10 to 30 minutes at 1450 to 1475°F in a neutral or reducing atmosphere is sufficient. Sometimes the coated articles are wire brushed after this treatment to improve their appearance. To offer sufficient protection against scaling, the sprayed coating should

(Continued on p. 128)



Automatic setup blast cleans and metallizes welded mild steel annealing covers with aluminum, saves money compared with heat-resisting alloys used previously



The 2000-ton press is adapted for attaching clamping cylinders on the moving-down platen so split dies can be used on the center ram for inverted press forging

Twenty-four clamping cylinders can be controlled in groups to hold any sized plate on the 36-foot planer It is used mostly for bevelling edges prior to welding

Two Giants For Tool Up

Flexible 2000-ton hydraulic forging press and 36-foot plate planer add important muscle to Lukens' fabricating shop. B-L-H built both with customer design help

IMPORTANT items in the extensive construction program at Lukens Steel Co., Coatesville, Pa., are two heavyweight machines supplied by Baldwin-Lima-Hamilton Corp., Philadelphia. One is a 2000-ton hydraulic press, designed with six pressure points for flexibility and improved performance; the other is the 36-foot plate planer for outsized machining.

Co-operation between Lukens' engineers who knew what they wanted the machines to accomplish, and Baldwin engineers who had the design know-how resulted in two highly efficient production units.

Flanging and Forming — The new press puts the company in a better position to do big flanging and forming work on heads, fan funnels, boiler domes, brake drums, magnesium pots, sugar kettles and similar products. It is a 4-column, downward-acting unit with a bolster-plate area of 90 x 144 inches. Maximum daylight height is 120 inches; minimum is 48 inches.

Two 40-inch, 1000-ton rams having a 72-inch stroke operate the moving-down platen which carries a 40-inch double-acting ram with a 40-inch diameter head, 48-inch stroke and downward capacity of 1000 tons. Moving-down platen can thus be used for clamping while the center ram is used for pressing. The 18-inch stripping ram, mounted inside the bottom platen, has a 66-inch stroke.

Something Different—A unique feature is the arrangement for mounting a ring of clamping cylinders to the underside of the moving-down platen. By using these as cushioning cylinders, large center ram will carry the split die for inverted forming. Versatility will cut production time in half on many jobs because the complete forging operation can be made with one heat; the arrangement also will prevent scale from falling into and jamming the plug center piece.

A 600-ton cushion cylinder with a 30½-inch diameter ram and 30-inch stroke, mounted beneath the press on its own foundation, serves the Marquette clamping system covering a 9-foot diameter circle designed for 3-inch knockout pins.

Plate Planer—The second of the two machines is used primarily to bevel steel plate edges prior to welding. It is an open-throat machine with a top carriage speed of 45 fpm. Running at 15 fpm at ⅛-inch feed, it can remove 34 cubic inches of material a minute from mild steel plate 1½ inches thick.

The 24 jacking cylinders, operated by 90 psi compressed air are capable of exerting a total of 240,000 pounds of clamping pressure. Arranged in four banks of six they can be worked in groups or all together to clamp any length plate.

Drive Protection—Carriage driving screw is drip lubricated for its full length and operates in tension whether cutting to the right or left. Placed under a slight overhang of the bed at the front, the 7-inch screw is protected against falling chips and dirt. Screw is supported along its length by cast iron cradles, and anti-friction bearings take care of thrust loading at the ends.

Carriage itself has two tool heads, and the cross slides mount on swivel plates. Thus, the clapper boxes, mounted on the cross slides, swing through 30 degrees below and 105 degrees above center.

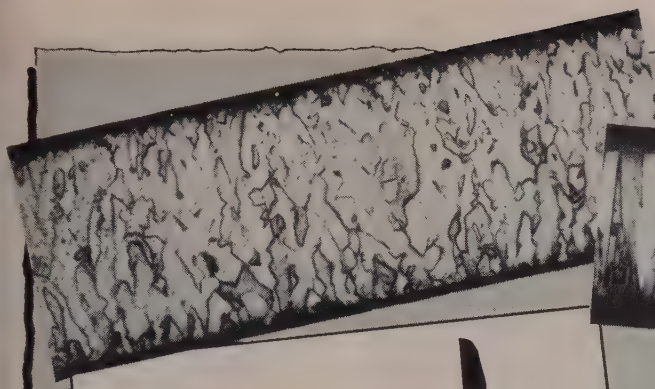


Fig. 1. Photomicrograph of sheet with large irregular grains. Printing quality not up to par.

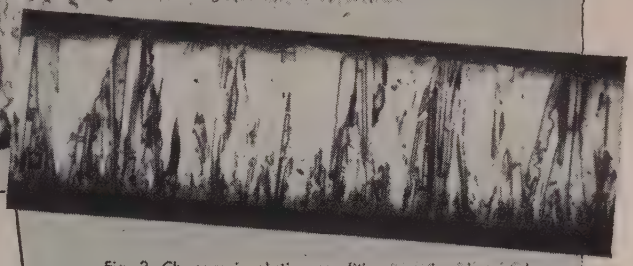


Fig. 2. Changes in plating conditions produced crystals more columnar in shape. A step in the right direction.

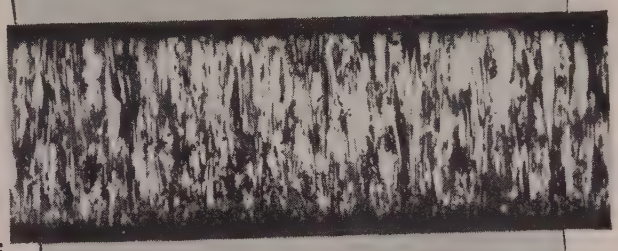


Fig. 3. Here is the structure that was found to give consistently good results. The copper deposit is of intermediate hardness and contains long, thin columnar crystals.

research at work!

A LABORATORY CAN SHORTEN THE SEARCH FOR A BETTER PROCESS

Copper, a basic and important requisite for the printing of Sunday magazines for metropolitan newspapers, has—since the introduction of rotogravure printing process in the United States—suffered from cylinder wear marks which have kept the industry puzzled, and often resulted in defective printing to such an extent that blemishes in printing were easily discernible to the eye—and although not too disfiguring, there remained the necessity for their elimination for the purpose of perfecting the gravure printing operation. In collaboration with a publisher, owner of one of the most modern plants in the world, Revere Copper and Brass solved this perplexing problem and is continuing to contribute to the technical improvement of the rotogravure printing process.

In preparing cylinders for printing roto sections, copper is plated on them before engraving. The electroplating of copper is rather an old process, and its techniques are well understood. By varying current density and composition of the solution, many different types of copper deposit can be obtained. But which of the various methods would give the best results in this case? Rather than engage in a lengthy process of trial and error, the publisher, who felt that the crystal structure of the deposited copper held the key, asked us if we would collaborate.

What Were the Crystals Like?

Sheets of copper resulting from different plating techniques were sent to Research, which not only made photomicrographs of the grain structure, but also determined tensile strength and hardness. As was expected, there were large variations. Some specimens had large and irregular crystals; in others, they were long and thin, like fibers standing on end. In tensile strength, the range was from about 31,000 to 56,000 p.s.i. Diamond Pyramid hardness numbers ran from 62.9 to 141.5.

Over a period of time five different sets of samples were submitted to the laboratory, which made detailed reports on each. By correlating these with his own records, the publisher was able to evaluate the effects of changes in plating techniques. The field of his investigation became narrower after each laboratory report, and in the end it was possible for him to obtain medium-hard, fine grain deposits which require little grinding and polishing. These results now are duplicated daily on a commercial basis. Today the publisher is noted for the exceptionally fine printing quality of his rotogravure sections. The newspaper is The Inquirer, Philadelphia, Pa.

If You Do Not Have a Laboratory

This is an outstanding example of the value of applied research. Many companies occasionally need information that can only be supplied by a laboratory, but are not justified in spending the large sums required to buy and maintain scientific equipment, and to employ qualified research personnel. These firms naturally seek outside sources of the data they require. Revere was glad to cooperate in this instance, because it produces large quantities of copper anodes for plating, and has both the equipment and the experience to make thorough tests of electro-deposited copper sheets or layers.

* * *

The Revere Research Department operates a laboratory that contains the latest scientific equipment, including the spectrograph and X-ray diffraction apparatus. If you feel the need of laboratory work on copper and its alloys, or aluminum alloys, please get in touch with the nearest Revere Sales Office.

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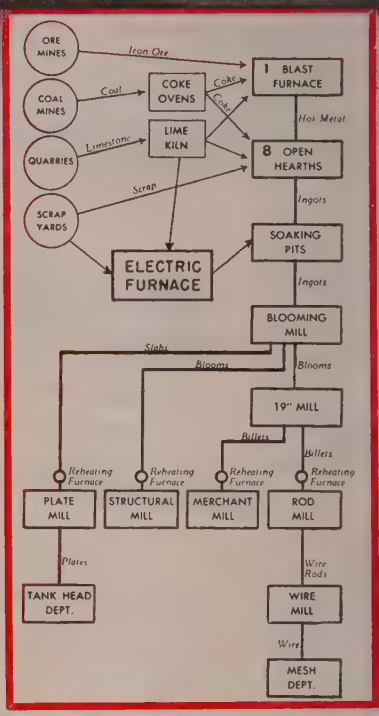
SEE REVERE'S "MEET THE PRESS" ON NBC TELEVISION EVERY SUNDAY

Sheffield's mill on the banks of Houston's ship channel may look out of place in the industrial scene, but its production is manna to the Southwest



TONNAGE WAS GOING SOUTH SO . . .

The Mill Moved To Its Market

Sheffield watched an ever-increasing tonnage from its Kansas City plant move into Texas and Louisiana. They followed it down, built a plant and have been expanding it ever since

STEELMAKERS' maps show a small isolated dot in the Houston area, indicating Sheffield Steel Corp's integrated mill. Keep your eye on that little dot. . . it's sitting square in the middle of one of the fastest growing industrial areas in the nation, and its nearest competitor is hundreds of miles away.

Here's a mill that was designed with expansion in mind. Located on 675 acres of choice industrial ground fronting on Houston's famed deepwater ship channel, present facilities are laid out with the kind of elbow room that makes Northern mill operators drool. Other factors help paint a rosy picture for this wholly-owned Armco subsidiary.

Raw Materials — Significantly, Sheffield's 1 million ingot-ton yearly capacity is produced from local raw materials, and nearly all of the output is consumed in the immediate area. Wash ores from Cherokee county, east of Houston, are mixed with Northeast Texas ores and small quantities of rich Mexican Durango ores. Limestone comes from the extensive mid-Texas deposits, and coking coal is shipped from Oklahoma mines. Reserves in all cases are considered ample.

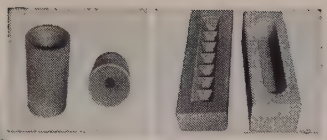
The scrap picture, bright as it is, would be even brighter had not mountains of it been sold and shipped to Germany and Japan in the 30's. Shipping distances too long to make it profitable kept the scrap trade nil and the piles mounting until the war-planning powers started taking it out by the shipload. The area still has a healthy scrap tonnage from which to draw.

How It Started—Sheffield management at the home plant in Kansas City began noticing in the middle 1930's that an increasing percentage of their output was going into the Houston area and the Texas market in general. As early as 1936 they were looking for possible plant sites.

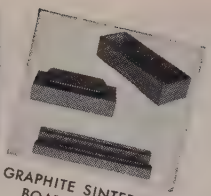
The Houston ship channel site was purchased in 1940, construction started in 1941, and the first

Scooping ore from under light overburden in east Texas. Low in iron as-mined, it is washed to furnace quality in a $1 million plant at Rusk

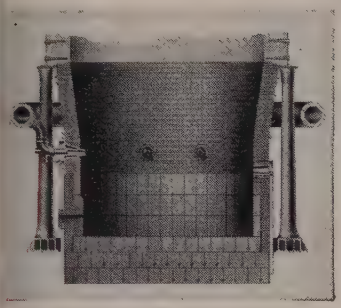
GRAPHITE CRUCIBLES



GRAPHITE MOLDS

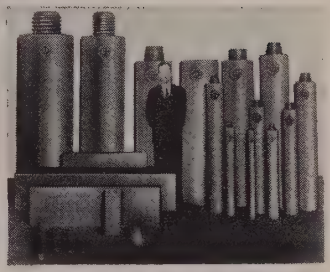


GRAPHITE SINTERING BOATS & TRAYS



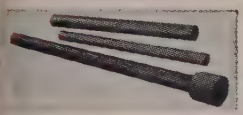
CARBON BLAST FURNACE LININGS

GET MORE TONNAGE FOR LESS



CARBON & GRAPHITE ELECTRIC FURNACE ELECTRODES

WITH THESE

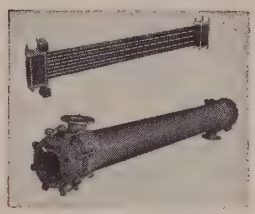


GRAPHITE FLUXING TUBES

NATIONAL

TRADE-MARK

Carbon and Graphite Products



"KARBATE" IMPERVIOUS GRAPHITE HEAT EXCHANGERS

CARBON LININGS FOR RUN-OUT TROUGHS

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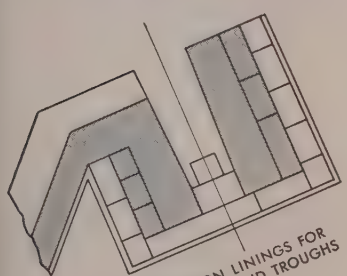
CARBON CINDER NOTCH LINERS



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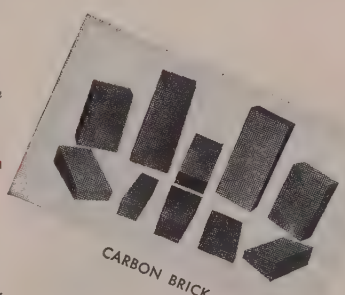

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SOME OTHER NATIONAL PRODUCTS

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Among the finished products are heads for butane tanks and other pressure vessels. Plate, structural members, merchant bars and rods make up the basic products for area consumers

ingot was poured in the spring of 1942. Ship plate and shell forgings weren't coming off in sufficient quantity to suit the war needs, so the government added two more open hearths, a blooming mill, plate mill and other facilities. To further speed up production, a 700-ton blast furnace and the necessary coke ovens enabled Sheffield to work the open hearths with hot metal charges.

Post War Days—At war's end, the Government ordered the blast furnace shut down, but the rest of the plant ran at capacity. The company soon acquired the two government-owned open hearths, but leased the blooming mill and other facilities. The blast furnace was returned to operation in 1947 and production pushed past the wartime peak. A sixth open hearth was added and two more were in service by 1949. Late in 1948, Sheffield acquired blast furnace, coke ovens and ore mines in East Texas from the government.

With no other mills using it up, scrap buildup has been tremendous in the industrial Southwest. Supply should be adequate for expansion plans

Most recent step in the development was installation of a 90-ton top-charge electric arc furnace whose production upped the mill's capacity to the million mark. Additional coke ovens are being built at the present time. What other expansion plans they have up their sleeves, Sheffield men are keeping to themselves, but one look at the Houston area will tell even the casual observer that the present facilities soon won't be big enough.

Satisfy Needs—Carbon and alloy steel produced by the plant in Houston are converted into billets, plates merchant bars, structural shapes, reinforcing bars and wire products. Consumer products include nails of all sizes, galvanized fence wire for farms and suburban areas, barbed wire for the Southwest's ranches, reinforcing mesh and other wire products.

Steel industry isn't new to Texas. Three times it tried to get a foot in the door, but only the latest effort by Sheffield succeeded. A century ago, the ore in Cherokee county near Rusk, Tex., was being smelted, but the post-war economy of the South couldn't support the operation. Again, near the turn of the century, small furnaces were in operation and one blast furnace was struggling along at Rusk. But after 1909 they gave up and no appreciable production came out of the area until the Houston mill went into action.

Like A Magnet—A good percentage of Houston's industrial growth in the last 10 years can be traced to the drawing power of local steel production. It is directly responsible for at least two new industries. One is the Tenn-Tex Alloy & Chemical Corp. which produces some 2500 tons of ferromanganese, ferrosilicon and other alloys per month, most of which goes to Sheffield.

The other is A. O. Smith Co. of Texas, owned jointly by Sheffield and A. O. Smith of Milwaukee. Located within sight of its steel source, this mill turns out welded pipe 30 inches or more in diameter in one of the most modern mills of its kind. From 30 to 35,000 tons of pipe skelp are turned into pipeline material every month for the oil and gas industry. Before this plant went into operation, it is interesting to note that in many cases, skelp from Sheffield was shipped to Smith in Milwaukee, made into pipe and shipped back for use in the Texas-Louisiana fields.

To these primary industries must be added the large numbers of fabricators, and users of steel who have been drawn to the producing area. Construction, both industrial and commercial, is making heavy demands on the steel supply, and indications are that the pace will continue for quite some time.

Ferromanganese Gets a Cleaning

A ferromanganese cleaning plant has been placed in operation at the Duquesne Works of the U. S. Steel Corp. The discharge of fume and dust from ferro blast furnaces will be eliminated by this facility, but the dust, which contains 14 per cent manganese, will be collected in the process.

Operation of a pilot plant at one of U. S. Steel Corporation's Ferro blast furnaces preceded the construction of the new facility by Research Corp., New York. Its engineers co-operated in the experimental period, developing the information necessary to design the gas conditioning and air cleaning portions of the plant.

Five electrostatic precipitators, with a combined capacity of 135,000 cubic feet a minute will be used to clean the gas, remove and collect the dust. About 98 per cent of all dust and fume will be removed by electrostatic attraction.

The dust will then be taken by screw conveyors into five rotary pyrophoring kilns. The mixture, which is light and floury in texture and extremely resistant to moisture absorption, continues into five mixers, followed by two batch-type intensive mixers, to insure thorough dispersal of moisture in the material before briquetting. Two briquetting processes with a combined capacity of 10 tons per hour then shape the material into pillow-like briquets.

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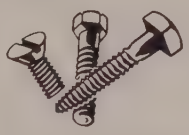

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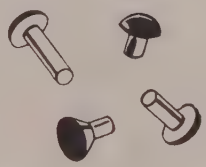
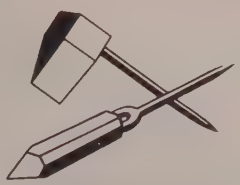
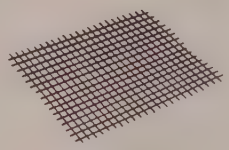


BRASS and COPPER RIVETS, BURS

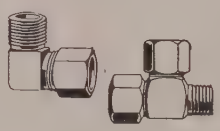
BRASS, BRONZE and COPPER WASHERS



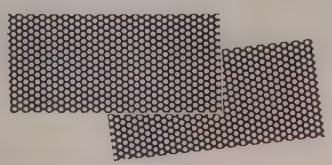
SOLDERING COPPERS



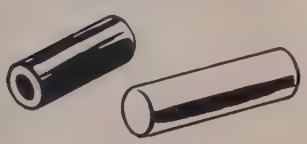
INDUSTRIAL WIRE CLOTH and BRASS STRAINER CLOTH



INDUSTRIAL and AUTOMOTIVE FITTINGS



PERFORATED METAL IN BRASS, BRONZE and COPPER



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NEW PRODUCTS and equipment

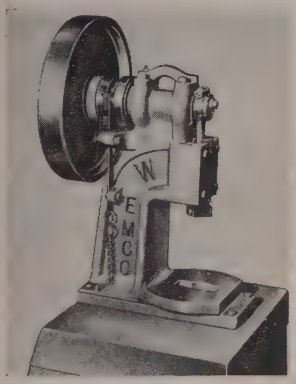
Reply card on page 113 will bring you more information on any new products and equipment in this issue

Bench-Type Punch Presses

. . . die space increased

Line of bench-type power punch presses is redesigned to afford increased die space by eliminating radius in column. In addition, a clamping device consisting of tool steel blocks and bit is introduced in the ram to gain a more rigid grip and eliminate set screws.

Bench type or stand-mounted presses, with or without motor



drive, are available in two sizes. Model W has standard ¾ and 1¼-inch stroke; model X, 1½ and 2-inch stroke. Klass Machine & Mfg. Co., Dept. ST, 4314 E. 49th St., Cleveland 9, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Chemical Steel Polish

. . . by 1-minute immersion

MirroFe, a room-temperature chemical steel polish, produces brilliant luster on most steel articles by simple chemical immersion. Its action also reduces surface roughness and deburrs sharp edges. A 1-minute immersion produces a luster equivalent to that obtained by a 30-minute deposit of bright nickel, according to the manufacturer.

The product also has application in chemically polishing steel dies to produce a fine micro finish that reduces die wear. Existing equipment found in most shops is satisfactory. MacDermid Inc., Dept. ST, Waterbury, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Redesigned Welders

. . . have one-dial control

Redesigned 200, 300 and 400 amp direct current generator welders incorporate one-dial control. Result is close control of welding current by means of an electrode-size selector and a large, easily-adjusted dial for minor current adjustments.

Convenient current control is made possible by setting the electrode selector to size of the elec-

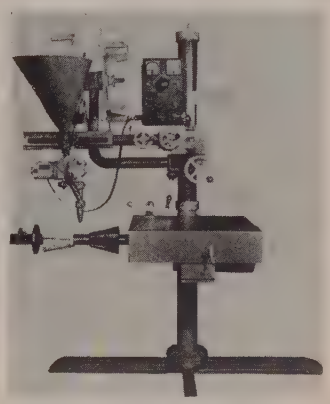
trode to be used, then turning calibrated current dial to desired heat. A reversing switch provides rapid change of polarity. Metal & Thermit Corp., Dept. ST, 100 E. 42nd St., New York 17, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Automatic Rebuilder

. . . minimizes replacement cost

This automatic rebuilder, model K-2, enables shops to rebuild wheels, pulleys, track rollers, idlers, etc., to minimize new part replacement cost. The rebuilder is designed to handle work of any size up to 40 inches in diameter. It



welds 30 inches of bead per minute, taking all types and sizes of automatic wire up to ¼-inch.

Adjusting wheel permits fine vertical adjustments of 1/64-inch. Gear reducer on the motor permits variable spindle speeds from ¼ to 3 rpm. Mir-O-Col Alloy Co., Dept. ST, 312 North Avenue 21, Los Angeles 21, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Chain Drive Overload Device

. . . protects against excesses

Device that protects chain drives of all types from overload operates

by tripping a limit switch in the event of excessive tension on the

drive leg. It is particularly applicable where processes as well as equipment must be protected from temporarily overtaxed mechanical drive systems.

Device consists of an eccentrically located idler sprocket counterbalanced by a weight-loaded arm. Counterbalanced arm is adjustable so the device will operate at any chain tension up to 1000 pounds. Manual resetting is required to energize the drive once an overload has caused it to react. Lamson Corp., Dept. STD45, Syracuse 1, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Automatic Parts Washer

. . . oscillating turntable action

Action of an oscillating turntable submerged in solution cleans small parts, complete assemblies and tools in this air-powered washer. Parts to be cleaned are placed in a specially-designed perforated basket that rides on the turntable; complete assemblies are placed directly on the turntable.

Speed of the automatic parts washer can be varied from 0 to 240 oscillations per minute by dialing desired speed on the ¼-hp air motor. Motor is operated by air pressures from 30 to 120 psi. Kelite Products Inc., Dept. ST, 1250 N. Main St., Los Angeles 12, Calif.

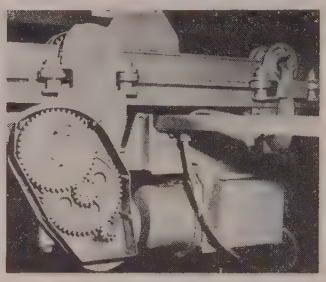
FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Motor-Driven Trolley

. . . any of 18 speeds

Motor-driven trolley for tramrail service can be furnished with any of 18 travel speeds by changing two or four gears. Trolley is designed for use with the manufacturer's shielded safety-type electrification, which carries current conductor bars in a metal housing directly under the track.

Double-reduction straight spur gear drive powers drive wheels. High starting torque electric motors with 1800, 1200 and 900 rpm permit choice of travel speeds from 56 to 600 fpm. Forker Corp., Dept. ST, 2050 Random Rd., Cleveland 6, O.



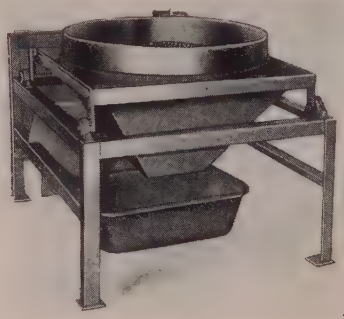
FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Screen Separator

. . . stroke adjusts 0-1½ inches

This medium-size separator is built to use standard 24-inch diameter foundry riddle. It is operated by ball bearing alternating current motor through nylon eccentric bushing.

Stroke of screen movement is readily adjustable from 0 to 1½ inches by loosening and tightening a single bolt. Bronze bushings are used throughout. Rampe Mfg. Co., Dept. ST, 3320 St. Clair Ave., Cleveland 14, O.



FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Industrial Power Sweeper

. . . dumps loads in 30 seconds

Picking up dirt and litter at speeds to 6 mph, this power sweeper is capable of sweeping more than 2 acres per hour. Loads up to 700 pounds can be dumped in about 30 seconds. A floating-type dirt hopper permits sweeping over uneven surfaces.

Dual pick-up system flips heavy dirt and debris into hopper and sucks lighter dust into fabric bag. Instant change from forward to reverse and 5-foot-radius turns through automotive-type steering mean effective handling in crowded areas. G. H. Tennant Co., Dept. ST, 2566 N. Second St., Minneapolis 11, Minn.

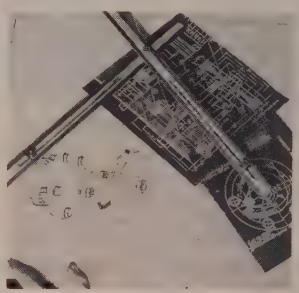
FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Pictorial Drawing Instrument

. . . ellipses to 20 inches

This simple device produces pictorial drawings in isometric, dimetric and trimetric by tracing the normal orthographic views.

The device can perform many functions which should make it a valuable tool for the commercial artist. It will draw an ellipse of any shape or size up to 20 inches, and the accuracy compares with that of a good quality ellipsograph. Wilkinson Co., Dept. ST, Box 638, Arnold, Md.



FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Barrel Tumbler

. . . removes slag, burs, rust

Barrel tumbler removes welding slag, flame cutting slag, burrs and rust from weldments and ma-

Ironsides' fleet of tank cars has recently been increased . . . now Palmoshield can be rushed to you the same day it is ordered.

New tank cars give you same day shipment of Palmoshield

Now a call to Ironsides gives you same day shipment. New tank cars have been added to our fleet to meet the growing demand for Palmoshield.

What's more you can be *sure* you'll receive the tin plate lubricant you need when you use Palmoshield. For Palmoshield is shipped by land from the heart of the steel industry — not by sea from foreign controlled sources.

Advantages of Palmoshield

Palmoshield looks, feels and acts like palm oil and requires no changes in mill operation.

Palmoshield is made from freely available domestic materials — not from materials found half-a-world away.

Palmoshield can be secured by a call to Ironsides in centrally located Columbus, Ohio. It need not be stockpiled.

Palmoshield is tailor made to meet your own special requirements. Free fatty acid can be controlled to within ½%.

Palmoshield increases production

Recently a leading steel company during a run of 20 consecutive shifts increased production 15% over the average output with imported oil. In addition, one company broke the single shift record, and still another broke both 8-hour and 24-hour records. This was done with no increase in manpower and no change in mill operation.

Result of 60 years of specialization

Palmoshield is a product resulting from Ironsides' 60 years of specialized research in the field of scientific lubrication.

For assistance and information about your lubricating problems, call or write The Ironsides Company, 270 West Mound Street, Columbus, O.

SPECIAL LUBRICANTS and PRESERVATIVES

IRONSIDES SHIELD PRODUCTS PALMOSHIELD

wheelabrator®

Airless Blast Cleaning

Here's another firm that discovered why Wheelabrator airless blast cleaning is the profitable answer to all weldment cleaning problems. Thorough, low cost removal of all scale, welding flux and slag is, of course, the number one advantage but Wheelabrating provided these bonus benefits for this prominent manufacturer of presses and vulcanizers for the rubber industry.

one — Reduced manpower requirements 50%. Former method hand grinding and chipping.

two — Cut costly compressed air consumption due to reduced grinding.

three — Grinding wheel cost reduced 2/3—fewer wheels are needed.

four — Improved weld quality. Welders take more pride in their work.

five — Reduced leaks in pressure tight weldments.

six — Improved working conditions.

seven — Eliminated grinding dust problem due to scale-free metal surface.

eight — Versatility of Wheelabrating made possible cleaning of weldments once believed too costly to clean.

nine — Improved efficiency and production flow of welding shop.

You, too, can profit with Wheelabrator cleaning to multiply manpower, improve product and cut costs in your plant. For a complete, free survey of your cleaning operations or detailed information on the Wheelabrator, write or call today.

American
WHEELABRATOR & EQUIPMENT CORP.
509 S. Byrkit St., Mishawaka, Ind.
WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

Wheelabrator® AIRLESS BLAST CLEANING

NEW PRODUCTS and equipment

chined parts. Barrel is 32 inches in diameter, 48 inches long, with 2000-pounds total load capacity. Variable speed drive can be set at any desired revolutions per minute from 5 to 30.

Barrel door is positioned easily

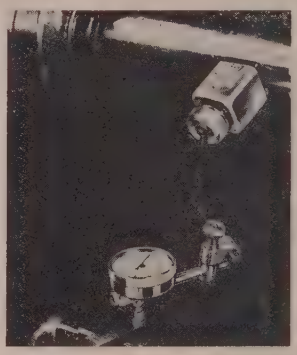
for convenient unloading and draining by pushbutton control. Neoprene linings throughout serve not only to extend barrel life, but assure quiet operation. White-Roth Machine Corp., Dept. ST, Lorain, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Magnetic Base Indicator Holder

. . . no haphazard clamping

Cumbersome and haphazard clamping is eliminated by these magnetic base indicator holders.



The holder is simply placed against any round or flat iron or steel surface, where its permanent magnet attaches instantly. With attach-

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

Yours FOR THE ASKING

TEAR OUT CARD, FILL IN and MAIL TODAY /

69. Aluminum Mill Products

Reynolds Metals Co.—The various wrought alloys, including aluminum sheet and plate, tubing, extruded and structural shapes produced by this company are cataloged in 1953 illustrated 12-page brochure. Finishes, tempers and alloys available are all described, and an alloy selection chart and data on fabrication and finishing are included.

70. Ovens & Furnaces

Cooley Electric Mfg. Corp.—Illustrations, specifications, descriptions—all are found in catalog which covers general purpose bench and floor type electric furnaces; high speed and recirculating furnaces; electric ovens; industrial box furnaces; and control equipment accessories.

71. Aluminum Soldering Flux

Insulation & Wires Inc.—Noncorrosive Aluma-Flux for soldering aluminum is described in 6-page folder which also gives physical and corrosion data and lists solders which can be used with it. How-to-use information is offered as well.

72. Snap Nut Fasteners

Prestole Corp. — Engineering and application data on Prestole snap nut fasteners is found in 2-page data sheet 8000-A. Series 8000 fasteners are illustrated, their use being for securing front mounting and/or blind assembly applications with metal screws or studs.

73. Power Brushes

Osborn Mfg. Co.—Various cleaning, scrubbing and finishing operations are applications for Heli-Master power brushes, described and illustrated in 4-page bulletin C-269. Also included is an application data sheet for specific factory recommendations on the proper brush for the job.

74. Materials Handling

Towmotor Corp.—Titled "How to Catch Man-Hour Thieves," illustrated booklet describes both the five major causes of man-hour losses in materials handling operations and the four basic plant operations where they are usually found. Suggestions for more efficient organization are made. Theme is treated lightly, with a root-in', tootin' Western motif.

75. Speed Reducers

Cleveland Worm & Gear Co.—This company makes a type CU speed reducer for cooling tower applications that is built for high speed heavy duty continuous service under extreme conditions of heat and humidity. Construction features, specifications and other data are in 4-page illustrated bulletin 135.

76. Lubrication System

Trabon Engineering Corp.—Description of methods of operation of the Trabon centralized automatic lubrication system is found in illustrated bulletin 529 of 4 pages. Reversible and manifold systems are covered and planning and application data are included.

77. Uniform Grinding Wheels

Simonds Abrasive Co.—Method of manufacture of grinding wheels for internal operations assures them of automatic uniformity of mechanical accuracy and grinding characteristics. Wheels are described and their grains and grades are covered in 4-page bulletin ESA-29. Various sizes and shapes are made up to 2½ in. diameter.

78. Screw Conveyors & Feeders

Link-Belt Co.—In 92 profusely illustrated pages, book 2289 covers a complete line of screw conveyors and feeds. Separate treatment is given to applications, components, engineering data, specifications and illustrated installations. Book is indexed, and includes many helpful tables and charts.

STEEL 8-3-53

Penton Building, Cleveland 13, Ohio

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PRODUCTS MANUFACTURED _____

ADDRESS _____

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3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
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7	17	27	37	47	57	67	77	87
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79. Electric Furnace

Whiting Corp.—Complete cost data presented in 8-page report "The Electric Furnace in the Iron Foundry" gives evidence of this furnace's economy. Twelve tables estimate costs on 8, 16 and 24-hour operation for electrical energy, labor, refractories, maintenance, electrodes, depreciation and interest. Request bulletin FO-6.

80. Zinc Coating

Sealube Co.—A zinc anticorrosion coating composition is described in technical reports and bulletins now available. This material is applied by brush or spray gun to iron and steel, and leaves a dried film of about 94 per cent pure zinc, giving protective results comparable to hot dip galvanizing and electroplating treatments.

81. Flow Meter

Republic Flow Meters Co.—For measuring widely fluctuating flows, dirty fluids and other difficult applications, pneumatic electric flow meter is described in bulletin 704. Static pressures as high as 2000 psi and differential pressures from 0.6 to 704 in. of water can be served. Bulletin illustrates and describes hook-ups, meter components and applications.

82. Universal Motors

Robbins & Myers, Inc. — Series wound motors for ac and dc circuits are subject of illustrated bulletin 444. Standard ratings range from 1/50 to ½ hp. The various type mountings are described with dimensions and complete specs.

83. Surface Condensers

Westinghouse Electric Corp.—Comprehensive data on radial-flow surface condensers are given in 32-page illustrated bulletin B-4350. Construction is fully gone into, aided by various cut-away drawings and shop photographs. Operating features are also discussed and illustrated with several installation photographs.

84. Gas Fired Heaters

United States Air Conditioning Corp.—Expanded line of series 23 gas fired unit heaters described in 4-page technical bulletin 23-2 includes sizes with capacities from 55,000 to 400,000 Btu per hour. A newly designed line of blower heaters, approved for use with ductwork, is also featured.

85. Industrial Tools

J. H. Williams & Co.—68-page catalog No. 301 is now available illustrating and describing entire line of industrial tools. Products include wrenches of all types, detachable and impact sockets, tool holders, C-clamps, lathe dogs, chain pipe tong and vises, flange-jacks, hoist hook eye bolts, rod ends, thumb nuts an screws, pliers, screwdrivers, punche and chisels, soft-face hammers, cran and balance handles and fender re pair tools.

86. Electrical Equipment

General Electric Co., Trumbull Elec tric Dept.—136 pages of 1953 editio of the Trumbullist General Catalo contains complete listings of safet switches, circuit breakers, service en trance equipment, motor controls an line of panelboards. Product section are segregated through use of colore divider sheets. Page of self-addresse post cards facilitates getting furthe information on engineered type prod ucts, also described in catalog.

EDITORIAL ARTICLES
Available in Limited Quantitie

87. High Speed Rod Mill

"Rod Mill Combines High Spee Top Quality" is STEEL article descri ing Jones & Laughlin continuous ro mill which was tailored to approx mate the production of three singl strand mills. Three 180-degree turn in the line serve to conserve spac Detailed flow diagram is offered a well.

88. What to Plate

Nickel restrictions forced manufa turers to stretch available nickel su plies and find substitute finishes suc as copper-chromium, zinc and whi brass to keep bright work on met products. How some companies a getting around the nickel shorta is related by Dr. Allen G. Gray, Tec nical Editor, in STEEL article "Wh to Plate."

89. Tumbling Deburring

Deburring job on compressor-rot wheels for Allison jet engines to two hours per wheel by hand. Ne method using a tumbling installati performs same amount of work be ter in about 8 minutes. Method described in STEEL article "Deburr Beats Hand Method."

90. Air Gaging

Problem of gage engineers today to provide measuring equipment th can be used by unskilled help wi skilled results. STEEL article "A Gaging: A Challenge and an Answe by F. Meyer Jr. of Taft-Peirce Mf Co. describes one development whi lets the variables cancel themselve

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8-3-53

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CITY AND STATE _____

ments, nearly all dial indicators can be held.

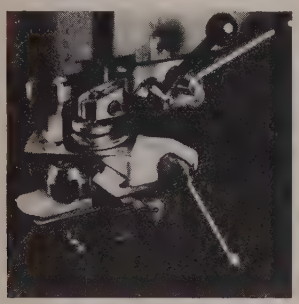
Swivel action post can be secured quickly and firmly in position with knurled locknut. Magnets available provide 50 and 100-pound pull. Lufkin Rule Co., Dept. ST, Saginaw, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Rubber Centering Device

. . . center mark unnecessary

Rubber center for circle cutting with manufacturer's sheet and plate working machines was developed for cutting disks from stainless and brass where no center point mark is permitted or where plating operations must follow. Rubber centers that hold metal are



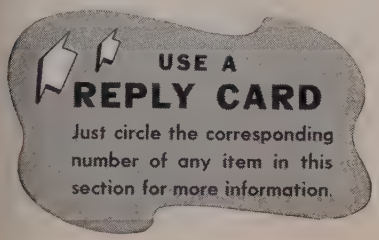
actuated by regular quick-locking centering tools and turn smoothly while metal is being cut. American Pullmax Co. Inc., Dept. ST, 2455 N. Sheffield Ave., Chicago 14, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Galvanizing Paint

. . . normal stoving technique

This galvanizing paint, Glopane Stoving, is a metallizing zinc coating for iron and steel, applied by normal stoving technique. Manufacturer reports the product gives the authentic electrochemical protection of a metallic zinc coating. Coating is said to act in exactly



The requirements for championship in golf are rigid:

- a genuine interest in the game
- ability to apply proved techniques
- practice-perfected skill
- proper equipment

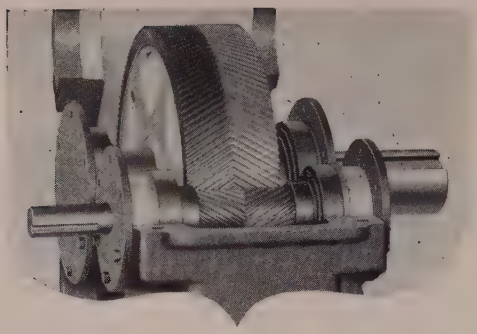
The requisites are the same in our game. When you select an industrial contractor, you want a company which is keenly interested in doing an outstanding job—has a broad knowledge of the best techniques—is thoroughly experienced—employs the most modern equipment.

The CCC team is proud of its qualifications and accomplishments—of the long list of clients it has served not once, but many times.

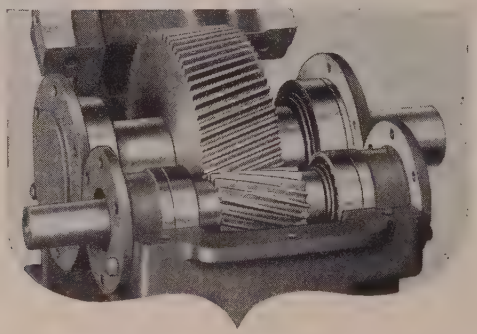
Just as any good golfer welcomes the chance to compete, so this industrial team welcomes the opportunity to bid on any project involving one or more of the many CCC services.

• General Construction • Building Alterations • Demolition • Foundations • Press Erecting • Machinery Moving • Crane and Conveyor Installing • Equipment Warehousing • Steel Fabricating • Export Packaging •

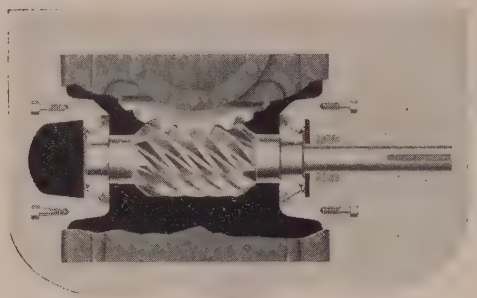
COMMERCIAL CONTRACTING CORPORATION
General Contractors
12160 CLOVERDALE — DETROIT 4, MICHIGAN



A Complete Line of Speed Reducers



HERRINGBONE · HELICAL · WORM GEAR



for Unbiased Selection of Type

● Horsburgh & Scott Speed Reducers are available in 3 general groups, 12 distinct types in many sizes and hundreds of standard ratios. Many considerations, such as speed of driving and driven shafts, shape of housing and characteristics of drive, point definitely to one specific unit as the best drive for a particular duty. Having such a complete line to select from, engineers have exceptional freedom for unbiased selection of the right reducer for the job.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U.S.A.

Send note on Company Letterhead for Speed Reducer Catalog 46

NEW PRODUCTS and equipment

the same way as hot-dip galvanizing.

Coating is applied by brushing, spraying or dipping, or by ordinary paint techniques. Brushed or dipped coatings are dry in about 20 minutes; sprayed coatings, in less than 5 minutes. Corrosion Ltd., 16 Gloucester Pl., Portman Sq., London, W 1, England.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Portable rpm Checker

. . . one-step operation

Portable instrument provides instant check on revolutions per minute of motors, machinery, revolving shafts, etc. Its simple, one-

step operation requires only that a rubber tip be pressed against revolving shaft. Instantly, revolutions per minute can be read directly off the dial.

It reads a minimum 40 rpm; maximum 50,000 rpm. Montgomery & Co. Inc., Dept. ST, 53 Park Pl., New York 7, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Compact Selenium Rectifier

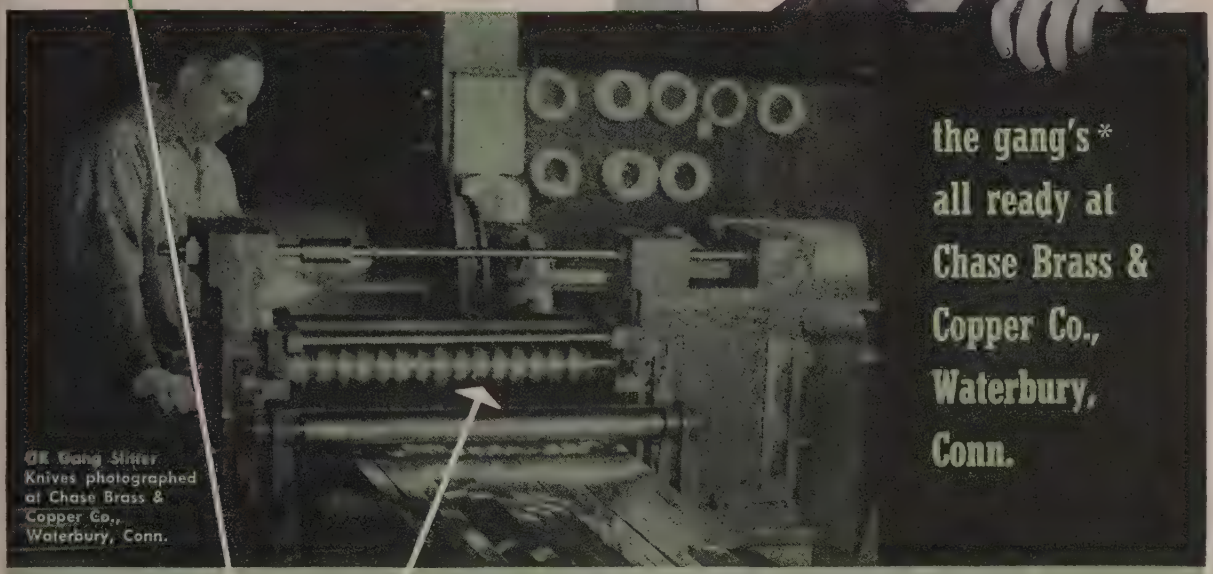
. . . dc from any ac source

Self-contained unit provides dc from any ac source. Eliminates the necessity for discarding small dc-

operated machinery when the power source is changed from dc to ac.

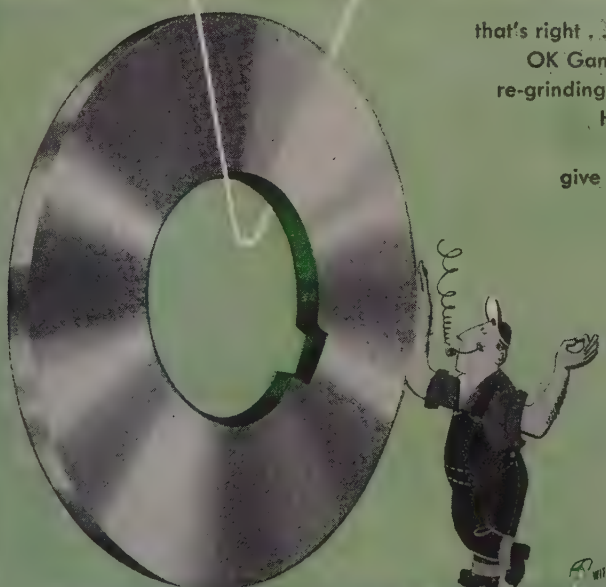
Rectifier employs selenium cells for its converting action; thus

it's OK let'er go!



OK Gang Slitter Knives photographed at Chase Brass & Copper Co., Waterbury, Conn.

the gang's* all ready at Chase Brass & Copper Co., Waterbury, Conn.



that's right . . . ready to knock down production costs because OK Gang Slitter Knives* can run hour after hour without re-grinding giving you top machine productivity at all times. Here's why: exact metallurgical specifications for OK steel—an exclusive heat treating process to give uniform hardness and temper—special grinding and finishing to tolerances of ± .00025 or closer if required.

Manufacturers for the Metal Working Industry of Slitter Knives, Shear Blades, Rotary Shear Knives, Hardened Spacers, Hardened Ways, Gibs, Ball Races, Bronze Ways, and Wear Strips.

OHIO KNIFE CO., DEPT. C
Cincinnati 23, Ohio
Please send free bulletins on OK Gang Slitters, etc.

NAME_____
COMPANY_____
ADDRESS_____ STATE_____
CITY_____

WITH OHIO GREEN

THE OHIO KNIFE CO.

CINCINNATI 23, OHIO, U. S. A.

The best way to buy stainless steel—plates, forgings, heads, rings, flanges, bars—is from the "one order" source, G. O. Carlson, Inc. Here at Carlson every item of your order is accurately produced, specifications are matched exactly, delivery promises are met. This control of each detail satisfies customers because it saves them extra paper work, extra stock handling and holds to their production schedules.

Carlson technical and practical experience, coupled with the use of specialized, high production equipment, provide an efficient packaged service. Your order for stainless steel plate and other stainless items is handled quickly, easily and economically.

To cut costs and eliminate confusion—check Carlson *first!* Your inquiry will receive prompt attention.

Stainless Steels Exclusively

G.O. CARLSON, INC.

PLATES • FORGINGS • BARS • SHEETS (No. 1 Finish)

THORNDALE, PENNSYLVANIA

District Sales Offices in Principal Cities

there are no tubes or moving parts to be replaced. Unit's ac input is single phase 110 or 220 volts. Its dc output is 110 or 220 volts. Sizes range from 1 to 8½ amperes. American Rectifier Corp., Dept. ST, 95 Lafayette St., N. Y. 13, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Extracting Tool

. . . removes without wedging

This extractor removes threaded broken parts without wedging them into place, works with any fitting in the pipe, hydraulic, aircraft or mechanical fields. It is available in a 20-size range.

Tool is designed to form teeth inside the hole until the shoulder

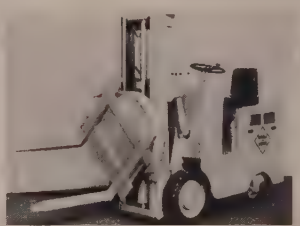
contacts the part, and permits high torque without expanding the part. Hexagon head can be gripped and turned with any wrench. Roddick Tool Co., Dept. ST., 1023 N. Pauline St., Anaheim, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Fork Truck Load Revolver

. . . means 360-degree rotation

Compact, hydraulically-operated load revolving mechanism was designed for this company's fork trucks. Unit permits 360-degree rotation, and is designed for use in



conjunction with the following fork truck attachments: Forks, roll paper clamps, up-enders and other load supporting devices. Power is

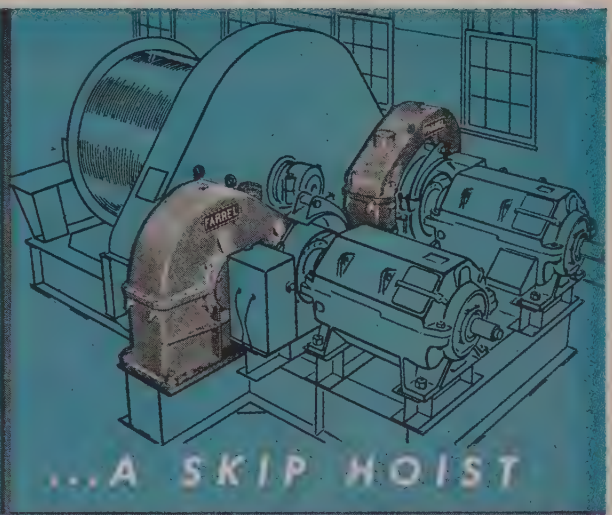
WHAT THE

Design Flexibility

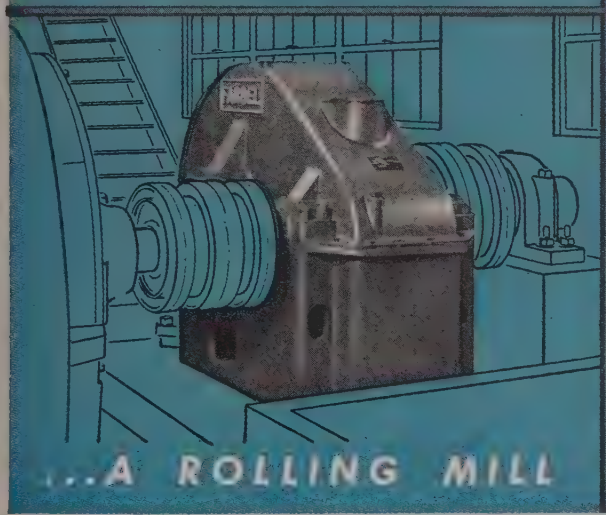
OF

FARREL® SPEED REDUCERS

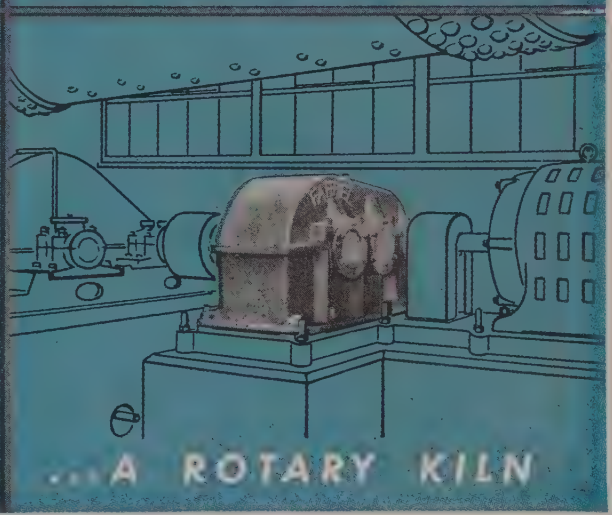
MEANS TO...



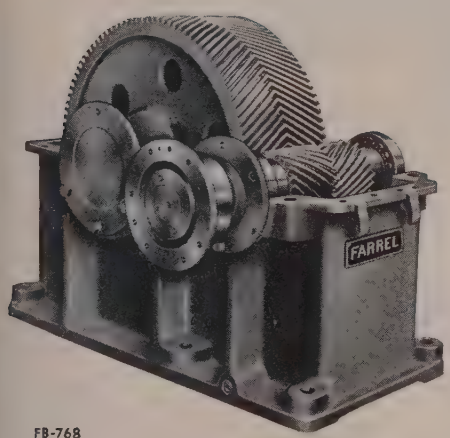
...A SKIP HOIST



...A ROLLING MILL



...A ROTARY KILN



FB-768

Design flexibility means the same thing in each of these applications: *a speed reducer that meets the drive requirements exactly.*

Farrel speed reducers, unlike most "standardized" products, are standard only in their principal features. They are adaptable in critical detail. Gears, shafts, bearings, and even some housing dimensions, can be proportioned to meet specific load, speed and service requirements. This flexibility has resulted in the solution of innumerable application problems.

In addition to this feature, Farrel speed reducers have a number of other advantages. The quiet, vibration-free performance of the herringbone gears results from extreme accuracy of tooth spacing, contour and helix angle . . . qualities inherent in the Farrel-Sykes method of gear generation. Precision manufacture and highest grade materials contribute to long gear life.

Shafts and bearings are factored to safeguard against interruption of vital processes. Gear cases are proportioned to withstand repeated heavy peak loads. Joints are sealed to prevent entrance of dirt.

Write for further details of these problem-solving units. Ask for a copy of Bulletin 449.

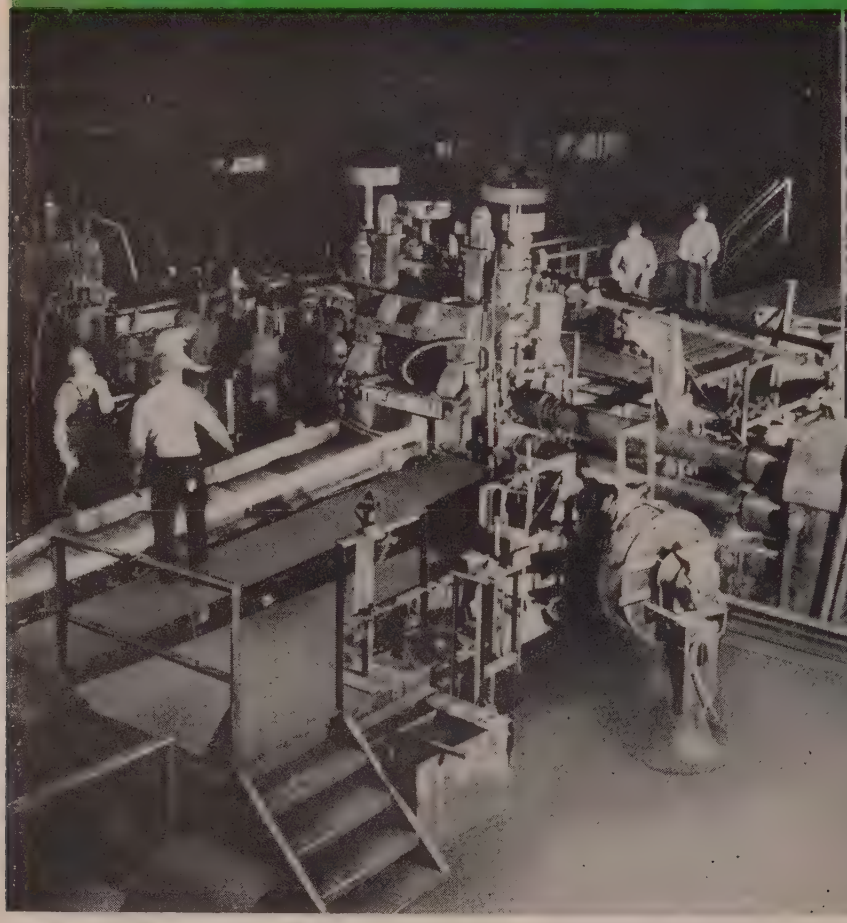
FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONNECTICUT

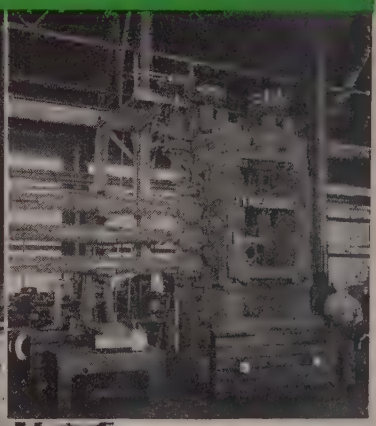
Plants: Ansonia and Derby, Conn., Buffalo, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Boston, Akron, Detroit, Chicago, Memphis, Minneapolis, Portland (Oregon), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

Farrel-Birmingham®

Treadwell





Shop view of the roll stand with spindles

Manipulators, Mill, etc.
Mills, Blooming & Billet
Mills, Merchant & Bar
Mills, Rod
Mills, Sheet
Mills, Strip (Cold)
Mills, Strip (Hot) & Skelp
Mills, Vertical Edging
Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Transfers

Coilers & Reels
Conveyors, Coil
Drives
Ejectors, Furnace
Gauges, Shear, Saw, etc.

Beds, Cooling
Beds, Inspection
Bumpers, Furnace

Pushers, Furnace
Repeaters

Handling Equipment (Kick-offs, Pilers, Cradles, etc.)

Steel and Iron Castings
Ni-Hard and Ductile Iron Castings

Three-High Mill for rolling precision rounds and squares up to and including 5″ round or square. The mill is equipped with motor operated screw-downs for both top and bottom rolls.

BETTER GRADE MACHINERY

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PITTSBURGH 22, PA.
ATlantic 1-2883

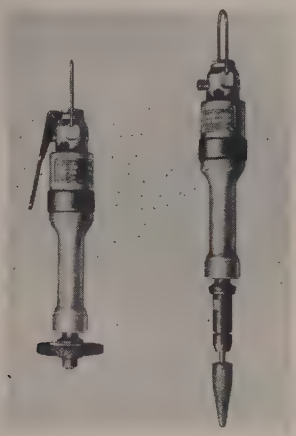
supplied by a gear type hydraulic motor with an integral worm gear reduction unit. This power application is powerful and easily controlled. Stops can be provided to limit degrees of rotation when desired. Unit is easily removed from the elevator plate should the truck be needed for operations not requiring the rotating feature. Elwell-Parker Electric Co., Dept. ST, 4205 St. Clair Ave., Cleveland 3, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

General-Purpose Grinders

. . . adaptable to die grinding

Two general-purpose grinders are adaptable to die grinding and can be used with rotary files, cutters



and midget mills. Available with lock button or lever throttle, these spindle grinders take 2-inch organic wheel and are offered with extension adapters for using mounted wheels.

Grinders weigh 1¾ pounds, can handle many grinding jobs that usually require heavier tools. Tools feature the manufacturer's one-piece shaft design. Rotor floats on the shaft, connected by two keys that are quickly and easily replaced. Buckeye Tools Corp., Division 18, Dept. ST, Box 966, Dayton 1, O.

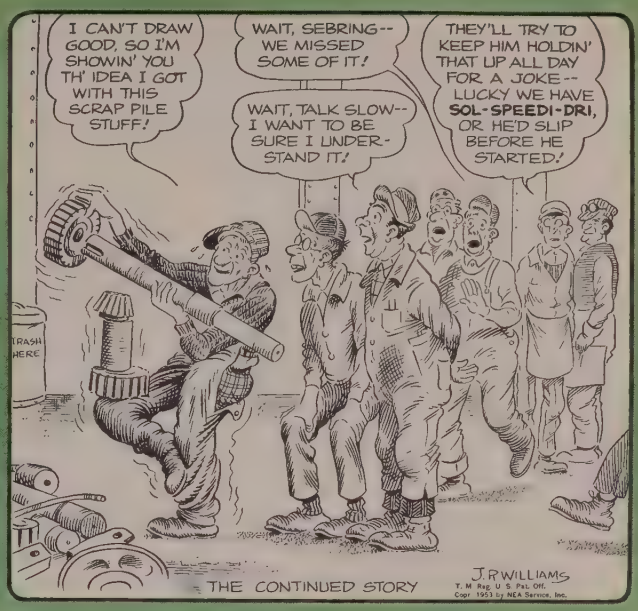
FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Improved Tubing, Sleeving

. . . flexible throughout life

Improved line of class H fiberglas tubing and sleeving retains flexibility throughout life of elec-

OUT OUR WAY


I CAN'T DRAW GOOD, SO I'M SHOWIN' YOU TH' IDEA I GOT WITH THIS SCRAP PILE STUFF!
WAIT, SEBRING-- WE MISSED SOME OF IT!
WAIT, TALK SLOW-- I WANT TO BE SURE I UNDERSTAND IT!
THEY'LL TRY TO KEEP HIM HOLDIN' THAT UP ALL DAY FOR A JOKE-- LUCKY WE HAVE SOL-SPEEDI-DRI, OR HE'D SLIP BEFORE HE STARTED!
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You buy an oil and grease absorbent because you don't want to take chances. So don't take chances with the absorbent you buy! Use Sol-Speedi-Dri to keep your floors clean and slip-proof. It leads the field, because pound for pound, dollar for dollar, it gives you *more for your money*, all factors considered. Laboratory control keeps quality always uniform. Send coupon *today* for free Sample!

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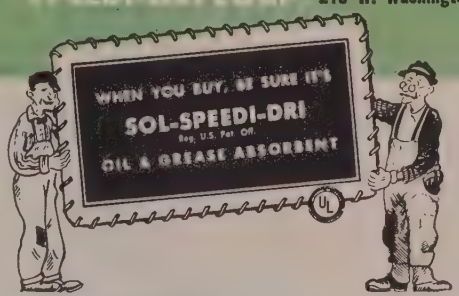

Warehouse stocks maintained in principal cities of the United States and Canada.

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Inquirers in New York, New England, and New Jersey should write to Speedi-Dri Corp. Elsewhere in U.S. to Waverly Petroleum Products Co., 1724 Chestnut St., Phila. 3, Pa. In Canada, G. H. Wood & Company Ltd., Toronto. Branches throughout Canada.

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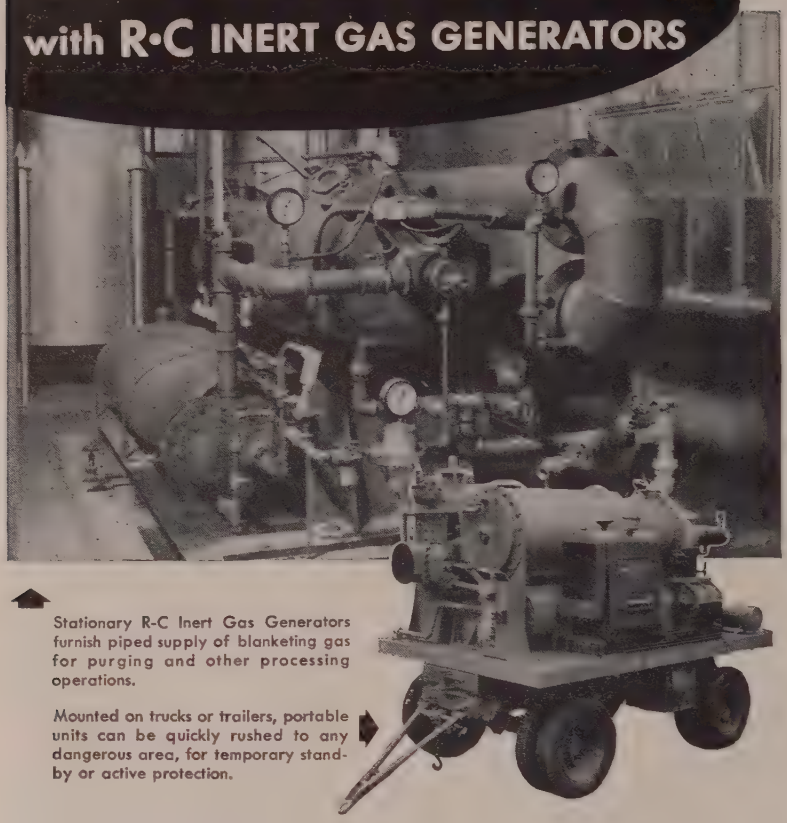
S-8-3-53

REDUCE EXPLOSION RISKS with R·C INERT GAS GENERATORS



Stationary R-C Inert Gas Generators furnish piped supply of blanketing gas for purging and other processing operations.

Mounted on trucks or trailers, portable units can be quickly rushed to any dangerous area, for temporary stand-by or active protection.

Where materials or processes may cause explosion-produced fires, such hazards can be greatly lessened by stand-by R-C Inert Gas Generators.

From stationary or portable units, a continuing flow of inert gas will blanket dangerous areas or can be used for purging explosive gas or liquid lines. Using either oil or gas as fuel, they operate at very low cost. Frequently, the comparatively small investment can be absorbed by more favorable insurance rates.

Units are available in capacities from 1,000 cfh to 50,000 cfh, with characteristics to match specific requirements. Write for details on how your fire and explosion risks may be reduced with R-C Inert Gas Generators . . . built by the specialists in equipment to handle gas and air.

ROOTS-CONNERSVILLE
Exclusive Specialists in Handling Gas and Air

ROOTS-CONNERSVILLE BLOWER
A DIVISION OF DRESSER INDUSTRIES, INC.
533 Stelton Ave. • Connersville, Indiana

trical equipment to which it is applied. Insulation is produced in 27 sizes from braided fiberglas coated with General Electric SE-100 silicone rubber.

Electrical and physical properties are unaffected by continuous operation through minus 90 to plus 400° F temperature range. Bentley, Harris Mfg. Co., Dept. ST, Conshohocken, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 20

Sprockets With Taper Locks

. . . bushings give shrink fit

Without reboring, this company's new line of roller chain sprocket wheels with patented taper lock bushings can be securely mounted on shafts, equivalent to a shrink fit. Set screws force and hold the split tapered bushing in the tapered bore of the sprocket wheel, causing it to lock tightly onto the shaft. Full length of the bushing supports the sprocket on the shaft.

Sprocket wheels with taper lock bushings available in sizes for ½, ⅝, ¾, 1 and 1¼-inch pitch single-width chains. Link-Belt Co., Dept. ST, 307 N. Michigan Ave., Chicago 1, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 21

Crane Scale

. . . accuracy: 2/10 of 1 per cent

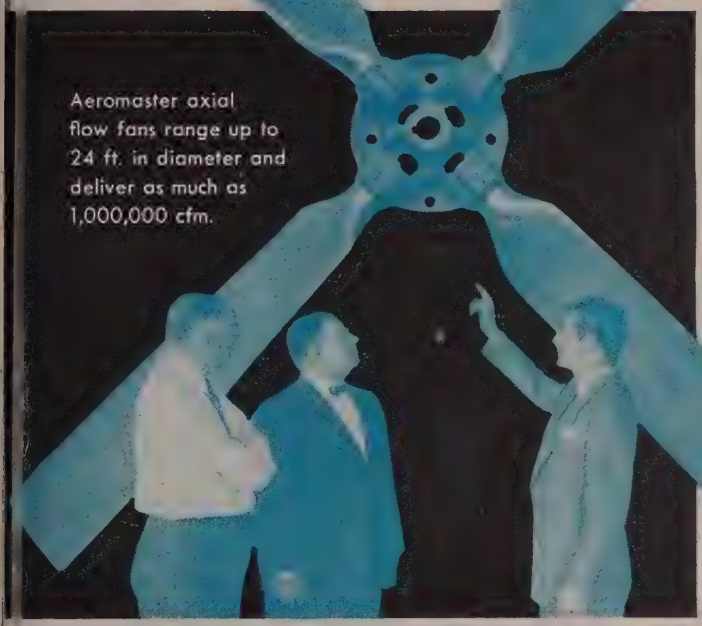
Offered in 1000, 2000, 5000 and 10,000-pound ranges, this crane scale is guaranteed to be accurate within 2/10 of 1 per cent of its capacity. A 25 per cent tare weight adjustment is provided, and complete zeroing assured. Tare adjustment control moves the needle rather than the dial.

The scale is designed to fit any hoist or crane application, adding 19⅛ inches to required headroom. A. H. Emery Co., Dept. ST, New Canaan, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 22

DUCTALLOY® CASTINGS GIVE KOPPERS FANS

Strong, Sound Hubs



Aeromaster axial flow fans range up to 24 ft. in diameter and deliver as much as 1,000,000 cfm.

Heart of each fan is its hub—made of Ductalloy to achieve sound, high strength castings.

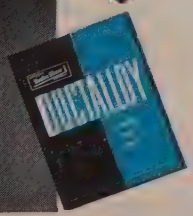
EASILY CAST, EASILY MACHINED

High performance fans made by the Aeromaster Fan Department of Koppers Company, used in cooling towers near diesel engines and compressors, must withstand considerable applied vibration in addition to normal operating loads. For this reason cast steel was originally specified to provide the necessary hub strength; but machining costs were excessive, surfaces were poor, and too many castings were "lost" when machining revealed hidden defects. A switch to malleable iron only aggravated the problem of casting soundness. The answer was Ductalloy 60—Brake Shoe's easily machined high strength ductile cast iron.

MACHINE SHOP REJECTS ENDED

Ductalloy 60 is a ferritic iron having 60,000 psi minimum tensile strength, 40,000 psi minimum yield strength and 10% minimum total elongation, all guaranteed. Use of this material has virtually eliminated the high scrap loss formerly encountered when defects were uncovered during machining of castings made in either steel or malleable iron.

your problem — Ductalloy may solve your problem if it involves economical production of complex metal shapes that are difficult to cast in steel, expensive to forge or lacking strength in gray iron. Brake Shoe's experience, research laboratory and experimental foundry are available to help you best utilize Ductalloy's unusual combination of characteristics. Write for this new technical bulletin today.



DUCTALLOY castings are made by:
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ENGINEERED CASTINGS DIVISION

AMERICAN
Brake Shoe
COMPANY

230 PARK AVENUE
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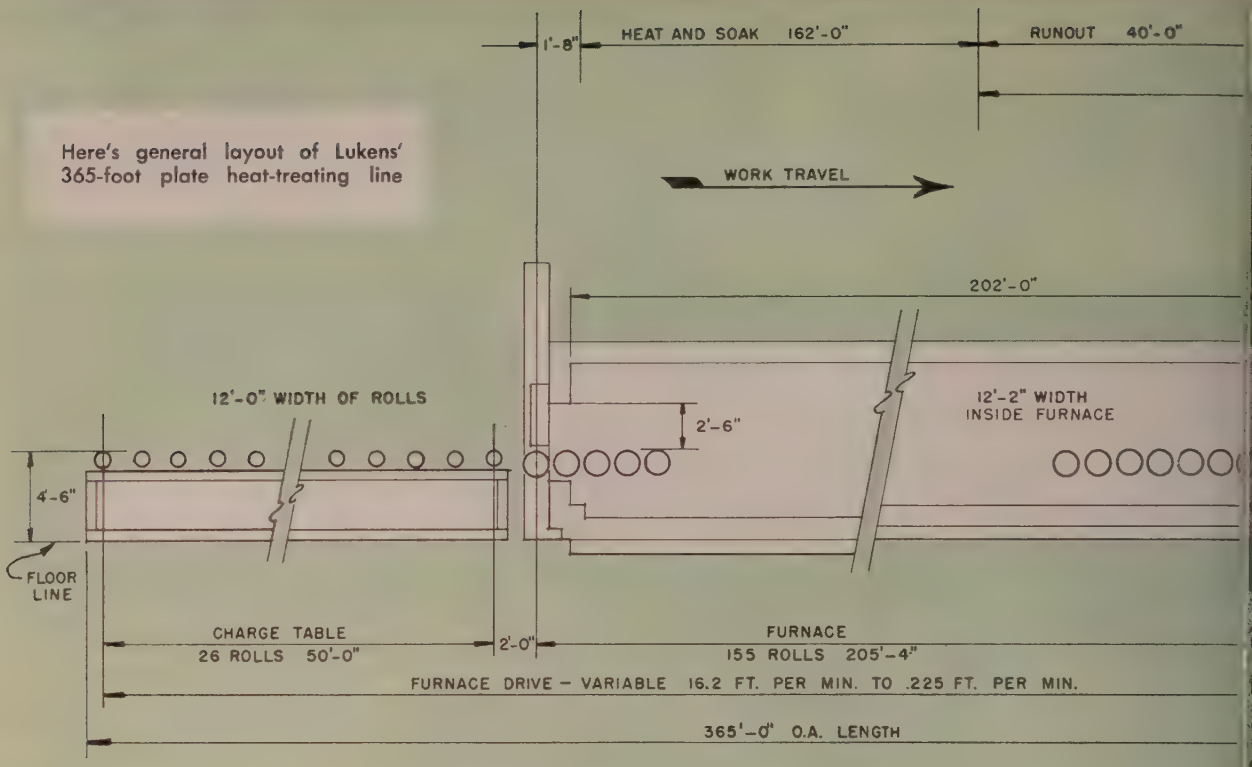


Here's general layout of Lukens' 365-foot plate heat-treating line

No Waiting in This Long Line

Continuous annealing line has over-all length of 365-feet; roller hearth furnace, operating between 950°F and 1950°F, will handle 130-inch by 480-inch plate

ANNEALING LINE longer than a football field, with a 1950°F heat-treating furnace that accommodates stainless steel or clad plates up to 130 inches wide by 480 inches long, is being installed at Lukens Steel Co., Coatesville, Pa.

One man, though dwarfed by the 365-foot continuous line, will keep the situation in hand from a control house next to the quenching press. As he controls motor-operated conveyor rolls, furnace doors and swing mechanism, he'll be confronted by: A 50-foot charge table, 202-foot roller hearth furnace, 10-foot transfer table, 42-foot, 1000-ton quench press and a 50-foot discharge table with a 90-degree swing for crane pickup.

Here We Go—From the charge table, huge plates ranging from 3/16 to 2 inches thick, will feed into the furnace through a door 12 feet-2 inches wide by 2 feet-6 inches high.

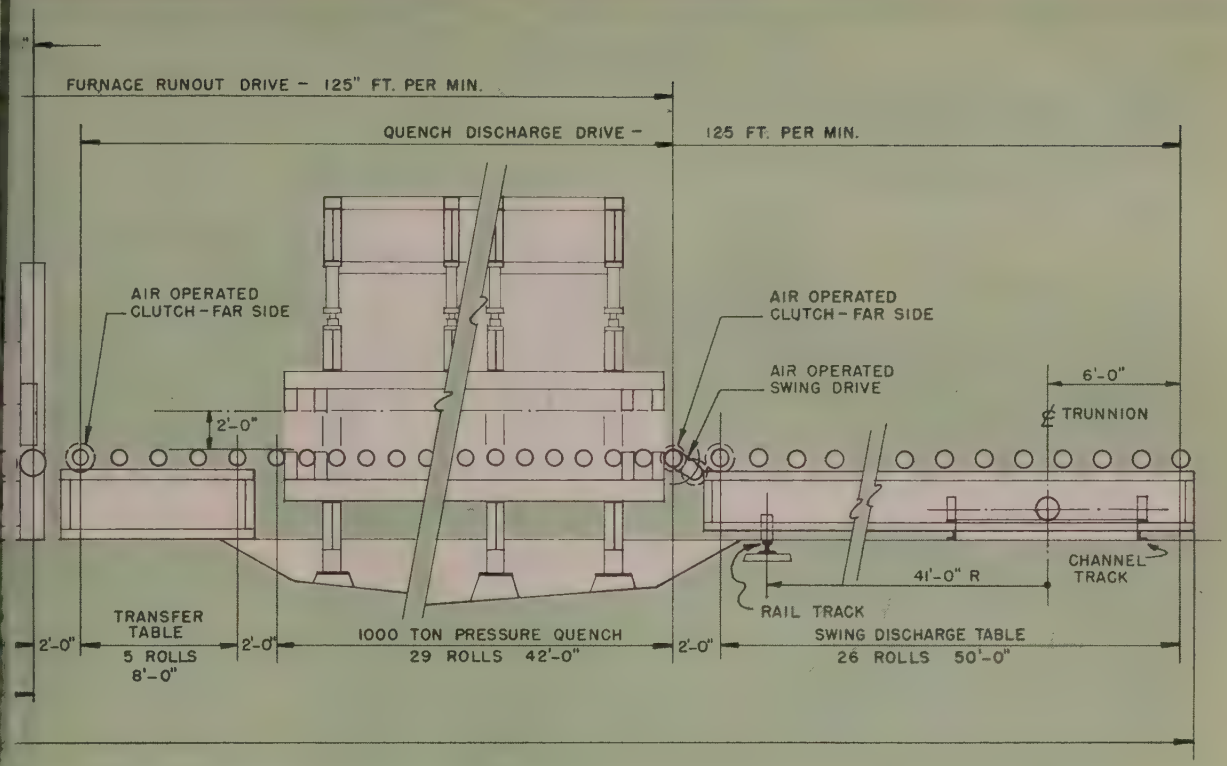
Furnace conveyor will have rolls 14 inches in diameter on 16-inch centers. Patented prepressed refractory construction will minimize marking of work. Special provisions will be made for quick removal and replacement of rolls, which will be water-cooled and insulated to minimize heat loss.

Roller-chain engaging sprockets on each roll will drive furnace rolls. Drive will be in four sections, all mechanically synchronized to avoid scratching work. Main drive unit will employ a hydraulic variable-speed transmission with electric remote control for variation of hearth speed. High-speed runout section (40 feet long) at discharge end will make for quick delivery of annealed plate to the quench press.

The Big Heat — Temperatures, some 400°F higher than those developed in conventional continuous heat-treating units, will be accomplished by direct firing. Combination natural gas or oil-luminous flame burners will do the trick.

Heat-treating cycles from 10 minutes to 12 hours will accommodate a wide variety of stainless and other steel analyses. Rated capacity for stainless steel annealing is 13,250 tons per month.

Temperature control will be proportioning and divided into 10 zones of 20-feet each. Maximum fuel capacity for natural gas will be 135,000 cu ft per hour or 960



ph for oil. Of course, necessary fety equipment will be incorpo- ted into the combustion system.

Spray, Squeeze—Quench press, e next station, will eliminate ich of the flattening usually nec- sary after heat treating. With maximum rating of 1000 tons, s effective bed is 10 feet-10 ches wide by 40 feet long, with maximum opening of 24 inches.

Work will be conveyed in and it of the press by driven steel lls mounted on a hydraulically tractable frame. It will deposit ork on the lower platen while ess quenching.

Press will be constructed of eavy structural framing with st steel sectional plates. Mul- ple bronze hydraulic rams will tuate the upper movable platen. perating at 1600 psi, the hy- aulic system will be of the pre- l type. To avoid oil spotting on ork, hydraulic medium will be ater.

Renewable spray pipes built to the upper and lower platens nd fed by manifolds will direct uench water on the work. By ushing a button in the control house, the operator will control water in four sections by means of diaphragm control valves. Maximum consumption will be 16,000 gpm at 60 psi. There will be two 400 hp pumps.

Some Trouble — Of course, there's always a hitch or two in every installation. In this case, it's heat-treating rollers.

Rollers designed to operate up to 1500°F have been made of hard, tough chrome alloy steel. But radically increased temperatures to be developed in the large furnace have prompted extensive research on a silcon-carbide roller.

Here's the problem: Clad and stainless steels will be heat treated at 1950°F. Different rates of expansion cause trouble in alloy and carbon steel rollers. When chrome rollers (satisfactory at 1500°F) were tried at elevated temperatures, rollers broke, bearings exploded and furnaces sometimes had to be cooled from 32 to 40 hours before repairs could be made.

Impurities Out—It was found that stainless steel plates developed metallic pick-up from rollers during heat treating. Plates were pitted and rendered unfit for use. Investigations show, however, that silicon-carbide rollers will carry stainless up to 2000°F, with no pick-up or other imperfections.

Next hurdle is to keep silicon-carbide rollers from cracking under the heavy bearing load encountered in production.

House of Giants—The 365-foot annealing line is but part of a $22 million expansion program at Lukens. An equally impressive machine is a 206-inch rolling mill that can produce steel plate up to 195 inches wide. It will roll a 96,000-pound plate that is 25 inches thick.

The new annealing line is the basic piece of equipment around which the entire alloy finishing plant is being reorganized. Building to house the unit has been completed and furnace foundations will be installed shortly. Entire annealing project is expected to be completed by mid-autumn or late this year.

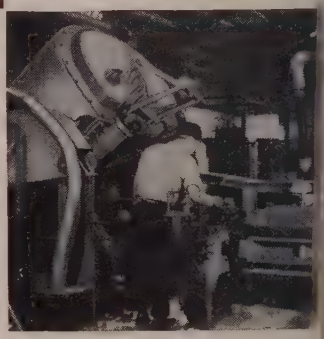
Line was designed and engineered by Drever Co., Philadelphia, in co-operation with Elmer W. Lindquist, consulting engineer.

Increase Your Profits—

get the highest possible recovery of aluminum scrap with the help of AJAX TAMA-WYATT Induction Furnaces—

AJAX induction furnaces are used in many plants for the efficient recovery of loose scrap, such as foil, chips, borings, turnings and the like. They are also adaptable for the full range of non-ferrous metals and alloys with the same advantages obtained in aluminum, and are built in sizes ranging from 20 kW to 1400 kW.

AJAX line frequency induction furnaces will melt aluminum foil scrap with the lowest obtainable melting losses. Photo above shows an AJAX 166 kW melting furnace installed at the plant of the Toyo Aluminum Works in Yao, near Osaka, Japan. Unbaled foil scrap shown at right edge of photo is remelted at the rate of about 900 pounds per hour with a recovery of over 99%. Molten metal is poured into ingot molds as shown in the front of the photo. Another view of same furnace is shown in small photo at right.



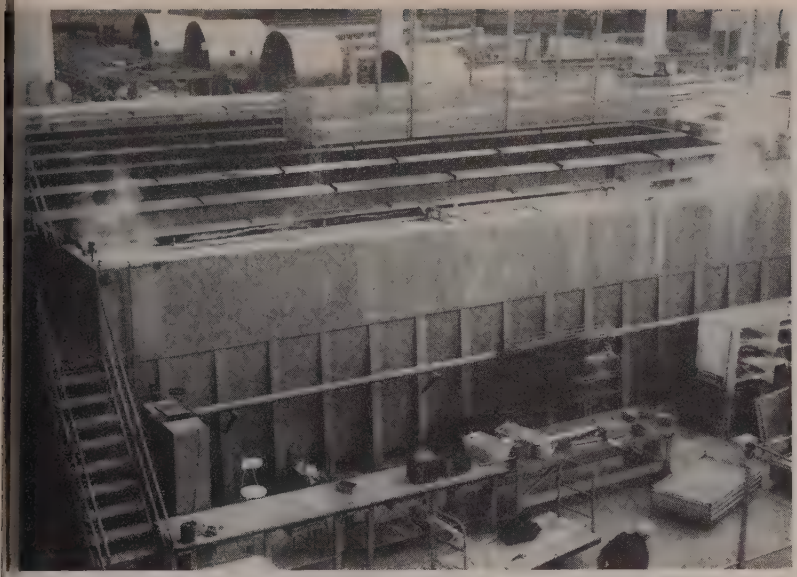
Send for Reprint of Article on Scrap Recovery by Induction Furnaces

AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX TAMA-WYATT

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax-Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax-Wyatt Induction Furnaces for Melting



line of these 18,000 gallon capacity tanks are used in the cleaning and preparation sequence, said to be cheaper and better than anodizing method

Aluminum Cleaning Time Sliced In Half

Chemical chromating process prepares even the biggest airframes for painting at Lockheed. Immersion process requires series of tanks 52 x 4 x 12 feet deep

CHEMICAL bathtub big enough to dunk-like-a-doughnut the largest airframe part ever built is now in operation at Lockheed Aircraft Corp., Burbank, Calif.

The unique facility is a nine-unit metal processing tank which features the new chromodize-iridite method of preparing and cleaning aluminum prior to painting. This is believed to be the largest chromodize-iridite facility in the aviation industry.

New Replacement—Centrally located in a special metal processing department at the company's main production plant in Burbank, the new equipment replaces two chromodize-anodize systems that were formerly in different buildings. Lockheed engineers report that the iridite process, which deposits an iridescent chemical film on the part by simple immersion in chemicals, is much more efficient and economical than the anodize method which oxidized the aluminum surface through electrolysis.

Use of the new system has cut time for the metal processing procedure in half. Formerly a 1½-hour operation, the entire job can now be done in 47 minutes. Metal parts that required up to 45 minutes for chemical treatment alone, under the anodize system, can now be processed in less than 5 minutes.

Process Advantages—Engineers listed these specific advantages of the chemical chromating process:

It provides a better base for paint adhesion since coating is tough and pliable, whereas anodized surfaces are hard and brittle. It can be applied on parts having dissimilar metals, whereas anodizing requires that no metal other than aluminum be placed in the tank solution.

System does not require special racks and racking procedures which were used to provide positive electrical contact for each individual part in the anodizing method. Very little, if any, maintenance cost will be required for servicing baskets used in the process, and work will flow more rapidly and efficiently, to and from other departments of the plant, through utilization of the centrally located iridite system.

Cleaning Sequence — Following operations will be performed by individual tanks, each of which is 52 feet long, 12 feet deep and 4 feet wide: Hot soap cleansing; acid etch to prepare parts for iridite; an iridite tank; one chromic acid tank for treating alclad aluminum parts to be painted; two spray rinse and two dunk rinse tanks; and one tank for drying.

Each tank has an 18,000-gallon capacity. Special demineralization apparatus is installed which can demineralize 15,000 gallons of water per day. The demineralization process removes chemicals and minerals from the water so that it becomes the equivalent of pure rain water, thereby improving the rinsing qualities.

Making Standard Do Specials

To solve special band sawing and band machining problems not within the scope of its many standard models, the DoAll Co., Des Plaines, Ill., manufactures special band machines to customers' orders.

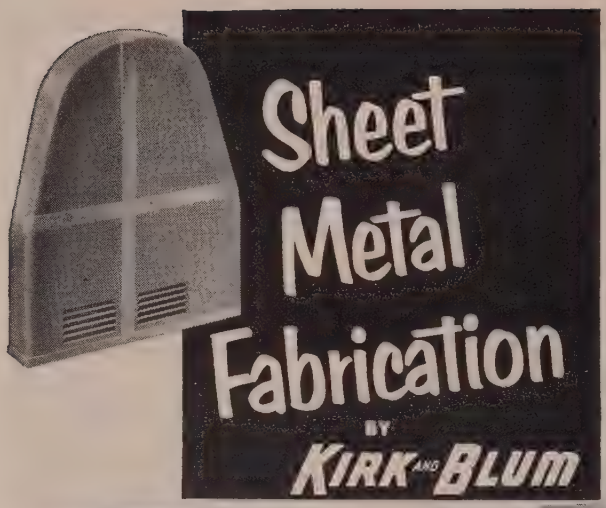
Typical of "specials" is an extra-work height, heavy-duty model. It will be used to cut explosives (shells, etc.) to permit interior inspection. As a safety measure, the machine is arranged for remote control.

Machine was adapted from the company's model MP-20, which accepts band tools for filing, grinding and polishing as well as sawing. It has a work height capacity of 24 inches, a 36-inch stroke and is equipped with a hydraulically powered, heavy duty table.

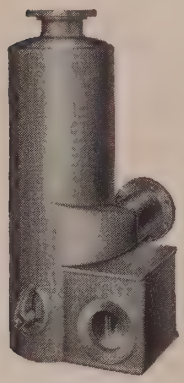
Controls, such as the blade welder and complete standard control panel normally incorporated into the column of the standard model, are housed separately in a remote control panel. Final installation of this unit will permit every phase of the machine operation to be carried on at a safe distance.

Process Cleans-Prepares Metals

A 12-page brochure completely describing their Alkalume metal-cleaning process is announced by Northwest Chemical Co., Detroit, manufacturers of specialized chemical cleaners.



Contract Manufacturing Facilities



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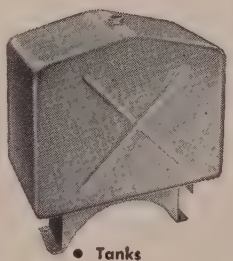

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This 40 page comprehensive booklet shows typical examples of Kirk & Blum fabrication, complete facilities of plant and equipment for jobs ranging from one unit to thousands.

KIRK AND BLUM
METAL FABRICATION

PLATING ALUMINUM . . .

(*Continued from p.* 101)

be at least 0.010-inch thick. Scaling resistance of sprayed aluminum coatings is much improved if the steel is first sprayed with a chromium-nickel alloy before the aluminum deposit is applied.

Large Structures—Spraying is especially suitable for coating large structures or sections that cannot be conveniently calorized or hot-dip coated. It does not involve expensive equipment and is particularly useful where many pieces or large surface areas of one piece can be conveyed through the spraying unit. Typical of the commercial products that may be improved by aluminum spraying are aircraft exhaust parts, damper plates, heat-treating pots, and furnace and kiln parts.

Electroplating—There are several methods of electroplating aluminum coatings on steel. Plating can be done from anhydrous electrolytes composed of fused salt mixtures of aluminum and alkali chlorides or from inorganic electrolytes containing compounds of aluminum in ethyl bromide and benzol.

Investigations conducted at Aluminum Research Laboratories show that aluminum plating can be done from a bath composition of 80 per cent aluminum chloride and 20 per cent sodium chloride, maintained at approximately 350° F. Voltage required depends on the cell's geometry, averaging about 0.5 v per inch of anode-cathode spacing at 15 amp per square foot of current density.

How Fast—Deposition of aluminum from an aluminum chloride-sodium chloride bath proceeds at a rate of approximately 0.0004-inch thickness in 30 minutes at 18 amp per square foot. Current efficiency is about 80 per cent.

Since the speed of aluminum plating is low and there are operating difficulties such as controlling the fuming of volatile aluminum chloride, this method of aluminum coating has been limited in its commercial application.

Part II, which follows in STEEL next week, will discuss cladding and hot dipping.

WHY ALUMINUM?

. . . because it improves products and increases sales!

CASE NO. 37 PIONEER PORTABLE RAMP

By switching from wood to aluminum, the Pioneer Iron Works of Sioux City, Iowa, dramatically reduced the weight of these pig loading ramps from *half a ton* to only 200 pounds—a cut of 80%! Since these are portable ramps, moved from stock car to stock car when loading pigs, the importance of this weight reduction can be immediately seen. One or two men can now easily handle the ramps where formerly a crew was needed. Thus cost of operation is immediately lowered and the operation is speeded up.

Furthermore, aluminum does not rust, rot, mildew or otherwise deteriorate from exposure to weather. These aluminum ramps do not require painting or other protective maintenance—they are much easier to clean and thus more important savings are effected. These are the kinds of dividends you can realize by using aluminum.

In almost every industry a change to aluminum has provided manufacturing economies, improved designs and, at the same time, increased sales appeal. Ask Reynolds Aluminum Specialists to help you apply aluminum's advantages to your products and production.

Call the nearby Reynolds office listed under "Aluminum" in your classified telephone directory, or write to Reynolds Metals Company, 2520 South Third Street, Louisville 1, Kentucky. Also, write for complete index of Aluminum Design and Fabrication technical literature.

"Mister Peepers" returns September 13th on NBC-TV.

REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND

Greater Capacity for Cathode Ray

Overall view of the manufacturing area at the Allen B. DuMont Laboratories' new Instrument Division plant in Clifton, N. J., shows a part of the 118,000 sq ft of space used for development and manufacture of cathode-ray instruments. All office, laboratory, storage and production facilities are built on one floor

Substructure of Metals Determines Elastic Behavior

By NORMAN P. GOSS
Consulting Physicist
Mayfield Heights, O.

WHERE a metal is examined under a microscope, each grain is shown to be built up of countless smaller units called mosaics. This sub-boundary structure appears to be the inherent structure of all metals and alloys.

Evidence has been presented by many workers in the field of solid state physics which leads to the conclusion that the plastic and elastic behavior of a metal is largely determined by the substructure. Zapffe has shown by fractographic methods that all grains are inherently imperfect and that the sub-boundary structure is of great complexity. However, in many instances the sub-boundary structure appears to have great regularity and this would suggest that metals and alloys have some kind of structural periodicity.

Lot to Learn—While much is known about the mechanics of plastic deformation and work hardening, much remains to be learned about metals subjected to elastic stresses. The question is, how does elastic stressing of a metal effect the sub-boundary structure of the grains?

X-ray diffraction studies of metals subjected to a cycle of stresses below the elastic limit proved that such elastic action caused the grains to rotate relative to each other. Did the grains rotate or experience a displacement at the grain boundary, or did the sub-boundary block elements of the grains experience a change in orientation relative to each other?

Probably Both—It is likely that both types of displacement may take place where the grains are elastically stressed. These studies also showed that elastic displacement of the sub-boundary elements is largely rotational though it is likely that pure translatory displacement is also possible for grains which are properly oriented relative to the applied stress. It was also found that the elastic displacement of the grains was proportional to the strain; in other words Hooke's law was obeyed as expected.

These x-ray diffraction studies also proved that the grains have a sub-boundary structure and reveal clearly that the grains are not perfect in structure.

Resembles Creep—The elastic rotation of the grains or of the mosaic elements within the grain appears in many respects to simulate the change a metal undergoes in creep. However, the elastic stressing is a reversible process while creep is not.

It has been proved that when metals are subjected to creep, deformation by grain boundary displacement may occur. That grain boundary displacement may also take place elastically is interesting. The displacement in both instances is largely *rotational*.

Joint Conclusion—Recent work of Wood, Senter, McLean and others leads to the conclusion that the changes, which take place within a metal subjected to creep, are complex and depend upon the previous history of the material. Wood and Scrutton have further shown that for low rates of creep dissociation of the grain proceeds by the formation of cells, that is, disorientation of the elements of the sub-boundary structure, without slip.

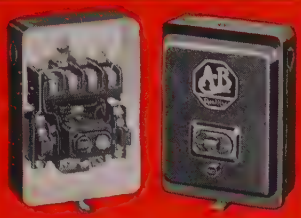
Elastic stressing in an analogous manner also causes a reversible readjustment of the sub-boundary structure. In fact, the mechanism of elastic displacement may in a sense be likened to a kind of elastic polygonization. In such a structure mosaic block elements are elastically displaced relative to each other, differing only slightly from the orientation of the grain itself.

While the mechanism of elastic grain displacement can be explained in simple terms, it is evident that the elastic action which takes place between the grains is complicated. Moreover, researchers have proved that the inner structure of grains have a periodicity or sub-boundary structure of great complexity.

Bulletin 600
Starting switch for small motors. With or without pilot lights.

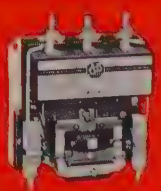
Bulletin 609
Manual starter for a-c motors. Up to 5 hp, 220 v; 7½ hp, 440-550 v.

Bulletin 609 Enclosures
NEMA Type 7 for hazardous gases. NEMA Type 4 for watertight duty.



Bulletin 709 Solenoid Starter
Form 1—Push buttons in cover
Form 2—Without push buttons
Form 3—With 3 way selector

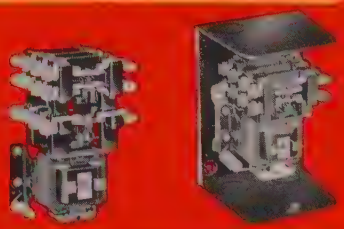
Bulletin 709 Solenoid Starter
Size 2—NEMA Type 1 steel enclosure



Bulletin 709 Starter
Size 4—Open type.

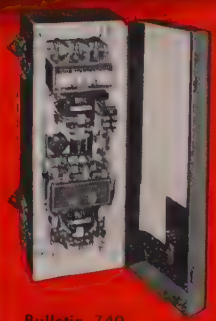
Bulletin 709 Solenoid Starter for motors up to 300 hp, 220 volts, 600 hp, 440-550 v. These starters are available in enclosures for any industrial service.

Bulletin 700 Type C
small 2-pole relay.

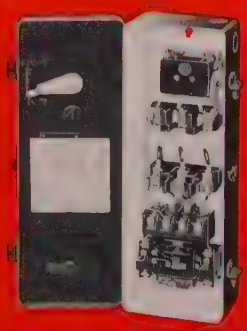


Bulletin 700 Type BX Relays
8-pole open. 4-pole enclosed.

Bulletin 746 Automatic Autotransformer Starter for squirrel cage motors.

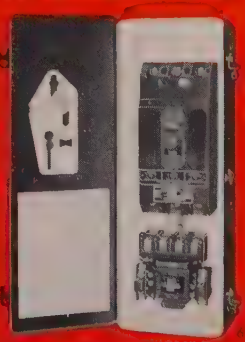


Bulletin 740 Automatic 2-Step Resistance Starter. Starters also available in 3 steps or for stepless acceleration.



Bulletin 712 Combination Starter with manual disconnect and fuse clips. (Left)

Bulletin 713 Combination Starter with ITE circuit breaker. (Right)



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The A-B trademark is recognized, everywhere, as a symbol of QUALITY in motor control and a guarantee of trouble free performance in all types of industries. Allen-Bradley engineering progressiveness blazed the trail of the solenoid starter. And Allen-Bradley still leads the field with solenoid starter performance in 8 sizes—up to 300 hp, 220 v; 600 hp, 440-550 v. Such leadership assures you maximum production from your motorized machines.

Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wis.

ALLEN-BRADLEY
TRADE MARK REG. MOTOR CONTROL
QUALITY

Allen-Bradley Special Automatic Control Panel showing variety of A-B relays, contactors, and starters.

A-B Quality

Let this **TRADEMARK** be your guarantee of **TROUBLE FREE OPERATION** for Large or Complex Control Installations

Are you looking for efficient and trouble free starters for large motors, or do you have a complicated control problem?

If so, you can be assured of the most modern and dependable equipment by calling in your nearest A-B control engineer. He has the experience and know-how to select the *right* combination of motor controls for each application.

Allen-Bradley controls are simple in design . . . hence more dependable and trouble free. The A-B trademark is a guarantee of QUALITY that safeguards manufacturing schedules. We shall be glad to send you an illustrated bulletin describing the Allen-Bradley line.

MULTI-UNIT PANELS FOR CENTRALIZED MOTOR CONTROL

Many modern plants concentrate their motor controls in a centralized group of panels . . . all enclosed in a sectionalized steel control center.

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Manual or automatic starters are available in the Allen-Bradley line of motor controls for large low voltage and high voltage squirrel cage and synchronous motors.

Manual or fully automatic starters with any special feature, such as indicating lights, can be furnished. For complete data, send for illustrated bulletins.

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1316 S. Second St., Milwaukee 4, Wis.

ALLEN-BRADLEY
QUALITY
TROUBLE FREE MOTOR CONTROLS

6-53-R

ound: Lost-Wax Profits

Army Ordnance realizes big savings in producing small gun castings at Watervliet

ENORMOUS savings are being achieved by Army Ordnance Corps in producing small gun castings—weighing 3½ pounds and less—by the lost wax process. Many thousands of castings are being produced monthly by this method at the Watervliet, N. Y., Arsenal.

In the great majority of cases, the castings replace forgings, and the savings result from elimination of most of the machining operations that were necessary on the forgings. Also, the lost wax process permits production of intricate castings which are difficult to make with normal practice.

Mortar Foot—A recent example is the successful application of the lost wax process to the production of the foot for the new lightweight 60-mm mortar. This is produced in 4130 steel, with 1/32-inch fins, and no machining is required after casting operation.

Watervliet Arsenal has developed a technique for coping with the occasional, unpredictable occurrence of decarburized spots on the surfaces of castings produced by the lost wax method. Their presence is hard to detect. The problem has been solved by subjecting all lost wax castings to heat treatment in a carburizing atmosphere which remedies carbon deficiencies.

Shell Molding, Too—Shell molding also is being used on an increasing scale at Watervliet to replace forged and machined gun parts with castings which require little machining or none at all. A recent example is a breech block closing spring cylinder. Cost of the finished part by shell molding is $8.67; when the piece was produced as a solid forging and machined the cost averaged $180 per piece.

Whereas Army Ordnance has had fine results from the use of cold extrusion, particularly in the production of shells, it now is investigating the possibilities of hot extrusion. It hopes to develop a hot extrusion method for economical production of recoilless rifles in one piece.

MUELLER BRASS CO.

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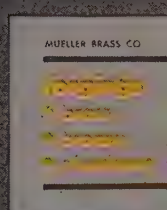
PRECISION MACHINED TO YOUR SPECIFICATIONS

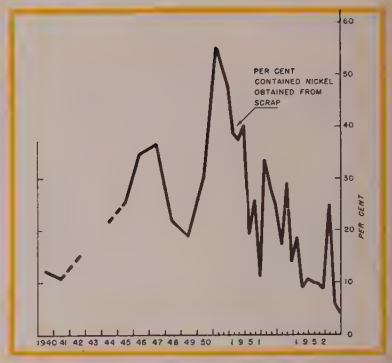


IT'S YOURS! NEW 32-PAGE FORGINGS ENGINEERING MANUAL WRITE TODAY

MUELLER BRASS CO.

PORT HURON · MICHIGAN

Cyanide pots made of HT grade alloy used to heat treat Chevrolet automotive parts. The grade is 15 per cent Cr



Curve shows the declining percentage of nickel found in high alloy castings which was obtained from scrap sources

Doing More with Less Nickel

By ERNEST A. SCHOEFER
Executive Vice-President
Alloy Casting Institute
Mineola, N. Y.

Alloy Casting Institute does work on low-nickel alloys to prepare for future shortages. Type HF shows promise as heat-resistant casting in 1600° F range

ODDS may be more against than for nickel ever becoming a readily-available metal again, even after NPA Order M-80, Schedule C, is lifted.

Future nickel famines, likely as not, can be blamed on expanded useage of high alloys.

A backward look reminds us that during World War II almost all high alloys went into process equipment, but at the tag end of the conflict, large quantities began to appear in military end products.

Now, with the development of jet engines and guided missiles, enormous amounts will be flown and blown away. So the day may not be too remote when demands of potential users of nickel (and chromium) will prolong current conservation programs. Even under present restrictions, we are producing about 3½ times more castings than we did in 1940 with only twice as much nickel.

Lean Picture—Today, such types as HW, HX and HU are practically eliminated from consideration for most uses, and the HT grade is confined mainly to applications involving exposure to carburizing or other chemically reactive media under conditions of high stress and thermal shock. For other service, lower nickel grades are the only answer.

Of course, a possible out is the recovery of more scrap, but here the downtrend continued through 1952. In fact, at the end of the year only about 10 per cent of the nickel contained in shipped castings was being obtained for this purpose.

Because of the pressing need for scrap, Alloy Casting Institute, Mineola, N. Y., plans to initiate research on the effect of tramp elements on the high-temperature properties of heat-resistant castings.

However, these are half measures. Optimistic accounts to the contrary, the nickel situation probably won't be brighter before 1954. For the interim period and expected future expansion, adequate alternates or substitutes must be found.

Getting Ready — With these things in mind, ACI started research 3 years ago on the once-neglected heat-resistant cast alloy known as HF grade, containing about 21 per cent chromium, 9 per cent nickel.

Chosen as a potential alternate for higher alloys requiring good strength at intermediate temperatures, HF has shown considerable promise in laboratory tests below 1600° F.

HF is similar to the popular CF-3 grade (19 Cr, 9 Ni); but until recently, it was rarely used in cast form for heat-resistant service. Since 1951, however, its production has increased ten fold, and satisfactory field results, especially in oil refinery installations, have been reported. Indications are it also has been acceptable for industrial furnace applications.

Alloy Program—Over the years, ACI has studied all alloys in the iron-chromium-nickel system with two things chiefly in mind: 1. Resistance to hot-gas corrosion. 2. Determination of chemical compositions providing optimum high-temperature mechanical properties. Extensive investigations have concerned types HH (25 Cr, 12 Ni) and HK (25 Cr, 20 Ni) in addition to HF alloys.

Corrosion—Tests show HF-type alloys in the Cr-20, Ni-10 range exceed minimum contents required for maximum metal loss of 0.50 inch per year in air at 1600° F. Results are comparable to those of HH, HT and HW grades.

However, chromium content in HF is insufficient to provide for satisfactory corrosion resistance at 1800° F. Test is made in an oxidizing flue-gas atmosphere containing 100 grains of sulphur per 100 cu ft, a condition more severe than air or sulphur-free atmosphere

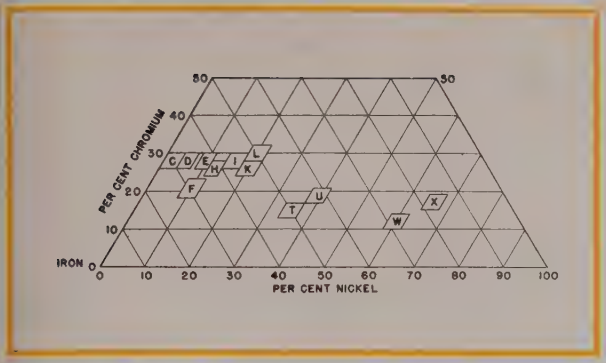
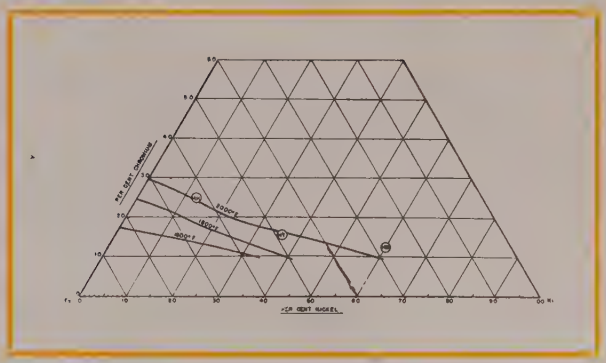


Chart shows how HF grade compares with the other cast heat-resistant grades found in iron-chromium-nickel system



Minimum Ni and Cr for maximum metal loss of 0.050 inch per year by air corrosion at 1600, 1800 and 2000°F

All higher-alloyed grades still have good corrosion resistance at this point.

When reducing flue gas containing high sulphur (100 grains sulphur per 100 cu ft) is used, only HH, HI, HK and HL stand up under cyclic temperatures. For moderately stressed applications, HE (29 Cr, 9 Ni) and straight chromium alloys also can be employed. Under 300-grain-sulphur atmospheres, only the latter two have satisfactory corrosion resistance above 1800° F.

Not Finished — ACI chemical range for chromium and nickel content in the HF grade is still quite broad. When research is completed, it is hoped more closely defined chemistry will be possible. Ranges of experimental heats, together with reference alloys and high and low corners in the iron-chromium-nickel group, also are being studied.

To date, it has been found that HF has short-time tensile and stress rupture properties quite similar to the HH grade at 1400 to 1600° F.

Values for the average linear coefficient of HF over the 70 to 1600° F range have been slightly higher than HH (70-1600° F = 9.9×10^{-6}) and substantially higher than HT (9.4) and HW (8.6).

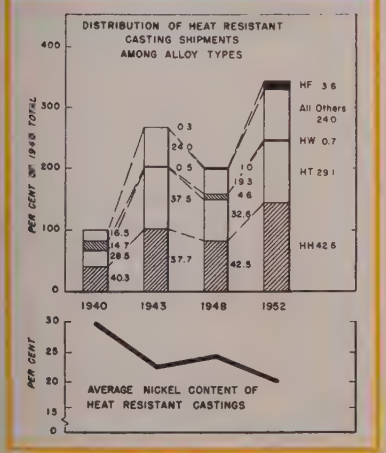
Other Alloys—ACI also is studying the HK grade (25 Cr, 20 Ni) to determine its susceptibility to sigma-phase formation. HK is one of the strongest alloys for service above 1900° F, but it has shown some erratic characteristics around 1600° F. The condition has been attributed to development of sigma constitutent.

HT grade (35 Ni, 15 Cr), top limit allowed for furnace parts, is being investigated to improve its resistance to thermal fatigue. Indications are heat treatment of castings before exposure to operating conditions may give substantial improvements to service life.

Other Projects—Another interesting piece of work shows that HT treated to improve carbide distribution doesn't fail under the ACI thermal fatigue test until after more than 600 thermal cycles. Untreated as-cast specimens cracked under the same heat in 11 cycles. Further work remains to be done in this area.

ACI has several projects slated for 1954, including work on high-temperature strength properties of alloys.

Article was taken from a talk given by Mr. Schoefer on May 18 before the Industrial Furnace Manufacturers Association in Hot Springs, Va.

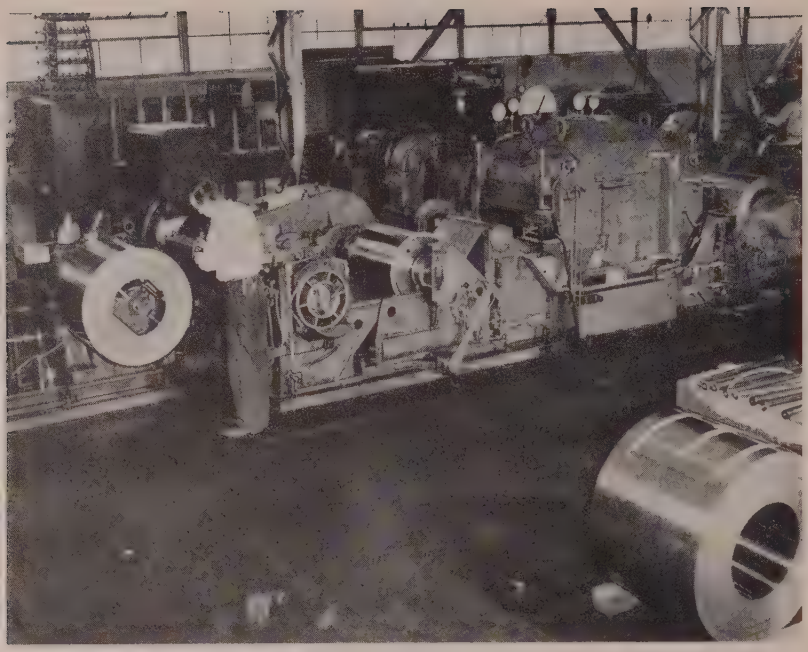


Distribution of shipments of heat-resistant castings is shown by alloy types and their average nickel content

ALLOY CASTING INSTITUTE HIGH TEMPERATURE RESEARCH PROGRAM HF TYPE ALLOY INVESTIGATION

Physical Property Data

Tensile modulus of elasticity—70°F, psi approx.		27,000,000
Density, lb per cu in.		0.280
Specific heat, Btu/lb./°F, 70°F		0.12
Specific electrical resistivity, microhms/cm³, 70°F		80.0
Melting point, °F approx.		2600.0
Magnetic permeability	1.000—	1.175
Thermal conductivity, Btu/hr./sq ft/ft/°F		
	70—212	9.0
	70—1000	13.4
	70—1500	15.0
Mean coefficient of linear thermal expansion per °F (x 10^6)		
	70—1000	10.0
	70—1200	10.3
	70—1400	10.5
	70—1600	10.6



Cold-Reducing Carbon, Stainless

This 25-inch Sendzimir mill is operated by Rodney Metals Inc. at New Bedford, Mass., cold reducing carbon steel to thicknesses as fine as 0.001-inch and stainless to 0.002-inch. The firm reports it maintains accuracy within 3 per cent across widths up to 25 inches. The mill is also employed where specifications require cold reduction of aluminum alloys to gages as thin as 0.006-inch

Tips On Better Sampling Of Steel Castings

When carbon analysis began to be consistently higher than customer's, this foundry called in the experts to discover why. Solution involved some tips worth remembering

A TWO-DAY visit by a trouble-shooter from an industrial consulting firm solved a problem that had complicated quality control operations in a foundry for several months.

The foundry was obtaining in its carbon analyses of steel castings results that were consistently higher than those obtained in its customer's laboratory. Careful and repeated checking of analytical procedures by the foundry's chemical staff failed to reveal any major sources of error.

In the hope that an outsider's viewpoint would be helpful, a chemist from Sam Tour & Co., a New York consulting and research firm, was called in.

Check Sampling — Investigation led back one step, to a survey of how the samples of the castings for the analysis were obtained. The coupons (sample bars) from which the samples were taken were not sufficiently clean, since they were taken to the laboratory in the same condition as they were when removed from the mold.

In this "as is" condition—with mold sand and an oxide coating adhering to their surfaces—the coupons were taken directly to a drill press to obtain chips for the analytical samples. Drillings were taken from one or several locations on the blank until a sufficient quantity of chips was obtained.

Major Faults — These initial steps, in which the sample was obtained by drilling with constant pressure on the drill, and screening to segregate the proper-sized particles, contained several major faults in the procedure.

First, when the technicians discarded the undersized chips, they not only discarded the undersized sand and oxide coating, but also quite probably, some segregated portions and hard particles that often end up in the fines. Consequently, the samples obtained by selective screening were probably not representative of the casting.

Actually, what should have been done was to remove the adhering sand and the oxide coating by grinding. Then, with these extraneous materials removed, the coupon should be drilled and all the chips obtained used for the analysis.

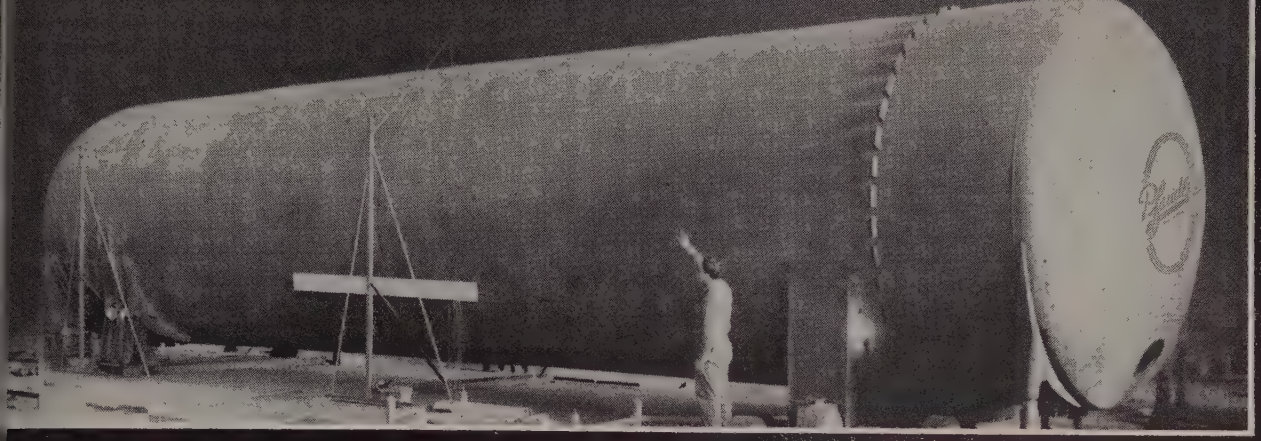
Improper Drilling—Second, the drilling technique used to obtain the chips was improper. The steady application of pressure on the drill into the blank caused the drill to overheat, resulting in partially-to-badly burned chips, identifiable by discolorations ranging from straw color to dark blue.

The consultant recommended the following procedures: Maximum drill speed, 400 rpm, but preferably 250 rpm. For stainless steel, he recommended the use of a straight, double-fluted drill or carbide-tipped flat drill, and emphasized that the drill must be sharp.

Furthermore, the drill must not be fed continuously into the work but should be raised and lowered repeatedly. This practice prevents overheating and thus burning of the chips, and will also produce more uniform size of chip for the analysis. When a bar is drilled it should be drilled on both faces at scattered locations on the bar and through about three-quarters of its thickness.

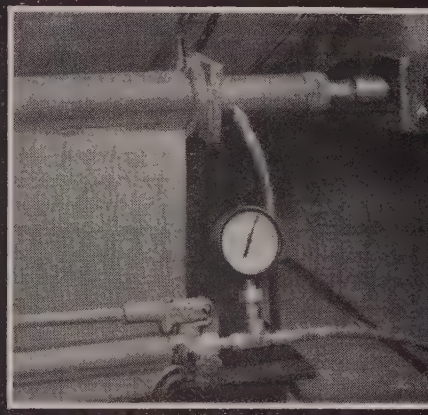
Other Contaminants—Every effort should be made to prevent contamination of the sample with oil or other carbonaceous materials. Such materials will introduce extraneous carbon into the analysis and can result in a sizeable error in analyzed carbon content. Drills should be free of oil, and the drillings must not be handled. Further precautions to assure the absence of oil should be taken by washing the drillings with ether prior to beginning the analysis.

Analytical errors can be reduced by pre-igniting the alundum beading in the combustion boats before use.



Welded, glassed steel tank 12′ x 54′; capacity 1426 barrels.

Radiography helps protect the quality in ,000,000 GLASSES OF BREW



Sound welds enable tank's legs to withstand 30,000 p.s.i. thrust test.

THIS GIANT glassed steel tank will store beer to fill one million glasses . . . store it safely and protect its quality in storage.

Thanks to radiography, its seams are sound, expertly welded to accept a lasting bond between steel and glass liner.

Thanks to radiography, its welded legs are sturdy—tested to withstand 30,000 p.s.i. That's 70% in excess of the code requirements in far western earthquake areas.

All this points up two important ways that radiography helps extend the use of welding: It helps to check and to develop welding skills and technics; it proves welds sound.

Radiography can help you get more business—build a reputation for high quality work. If you would like to know how, talk it over with your x-ray dealer.

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X-ray Division, Rochester 4, N. Y.

Radiography . . .

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Saved: $54,000 per year...

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from castings

to

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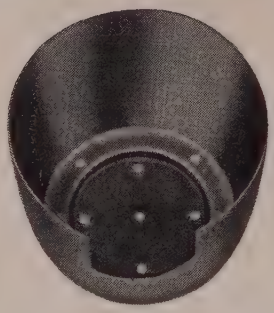

A large New England manufacturer called in Geometric engineers to study casting components of a new home appliance product. As a result the main casting shown above was converted to a stamping. Cost of the casting was $1.07, cost of the stamping only 57c—a savings of 50c on each part—or $54,000 saved per year.

If cost reductions like this make sense to you why not call in Geometric *now*—the earlier the better. There's no obligation and you may find substantial hidden profits—by converting from castings to Geometric Stampings.

Send for free booklet on Converting from Castings to Stampings

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A Subsidiary of Barium Steel Corp.

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CALENDAR
OF MEETINGS

August 17-19, Society of Automotive Engineer International West Coast meeting, Georg hotel, Vancouver, B. C. Society addres 29 W. 39th St., New York 18. Secretar John A. C. Warner.

August 19-21, Institute of Radio Engineer Western electronic trade show and conve tion, Civic auditorium, San Francisco. Bus ness office: 1355 Market St., San Francis 3. Business manager: Heckert Parker.

August 23-26, National Automatic Mercha dising Association: Annual convention a exhibit, Hotel Conrad Hilton, Chicago. A sociation address: 7 S. Dearborn, Chicag Secretary: C. S. Darling.

September 1-4, American Institute of Ele trical Engineers: Pacific general meetin Hotel Vancouver, Vancouver, B. C. Ins tute address: 33 W. 39th St., New York 1 Secretary: H. H. Henline.

September 2, Steel Kitchen Cabinet Manufa turers Association: Fall meeting, Ho Cleveland, Cleveland. Association addres 1008 Engineers Bldg., Cleveland 14. Sec tary: Arthur J. Tuscany Jr.

September 6-11, American Chemical Societ Fall meeting, Hotel Conrad Hilton, Chicag Society address: 1155—16th St., NW, Was ington 6. Assistant secretary: R. M. Wa ren.

September 9, Material Handling Institute: F meeting, Hotel Cleveland, Cleveland. Ins tute address: 813 Clark Bldg., Pittsburgh 2 Managing director: R. Kennedy Hanson.

September 9-11, Compressed Air & Gas Ins tute: Fall meeting, Fishers Island Count Club, Fishers Island, N. Y. Institute addre 122 E. 42nd St., New York 17. Secreta Frank P. Anderson.

September 10-12, Rocky Mountain Managem Club: Rocky Mountain industrial expositi University of Denver arena. Club addre 1031 15th St., Denver 2. Executive secreta treasurer: Harold S. Craig.

September 11-13, Metal Powder Associati Fall meeting, The Greenbrier, White Sulph Springs, W. Va. Association address: 4 Lexington Ave., New York 17. Secreta Robert L. Ziegfeld.

September 13-16, Electrochemical Society In Fall meeting, Ocean Terrace hotel, Wrigh ville Beach, N. Carolina. Society addre 216 W. 102nd St., New York 25. Secreta Dr. Henry B. Linford.

September 13-16, American Institute of Che ical Engineers: Fall meeting, Hotel Fairmo San Francisco. Institute address: 120 41st St., New York 17. Secretary: Steph L. Tyler.

September 14-15, American Machine Tool D tributors Association: Annual meeting, T Greenbrier, White Sulphur Springs, W. Association address: 1900 Arch St., Phi delphia 3. Executive secretary: Thomas Fernley Jr.

September 14-15, American Hot Dip Galv izers Association, Inc.: Semi-annual meeti Statler hotel, Cleveland. Association dress: 1506 First National Bank Bldg., Pit burgh 22. Secretary-treasurer: Stuart Swensson.

September 14-16, Allied Railway Supply sociation: Annual meeting, Hotel Sherm Chicago. Association address: 1200 Chase Ave., Chicago 26, Secretary: Cha F. Weil.

September 16-18, Porcelain Enamel Institu Shop practice forum, Ohio State Univers Columbus, O. Institute address: 1346 C necticut Ave., NW, Washington 6. Sec tary: John C. Oliver.

September 17-18, National Foundry Associati Annual meeting, Plaza hotel, New York. sociation address: 53 W. Jackson Blv Chicago 4. Executive secretary: Charles Sheehan.

September 18-19, American Ceramic Socie Refractories Division meeting, Bedf Springs Hotel, Bedford, Pa. Society dress: 2525 N. High St., Columbus 2, General secretary: Charles S. Pearce.

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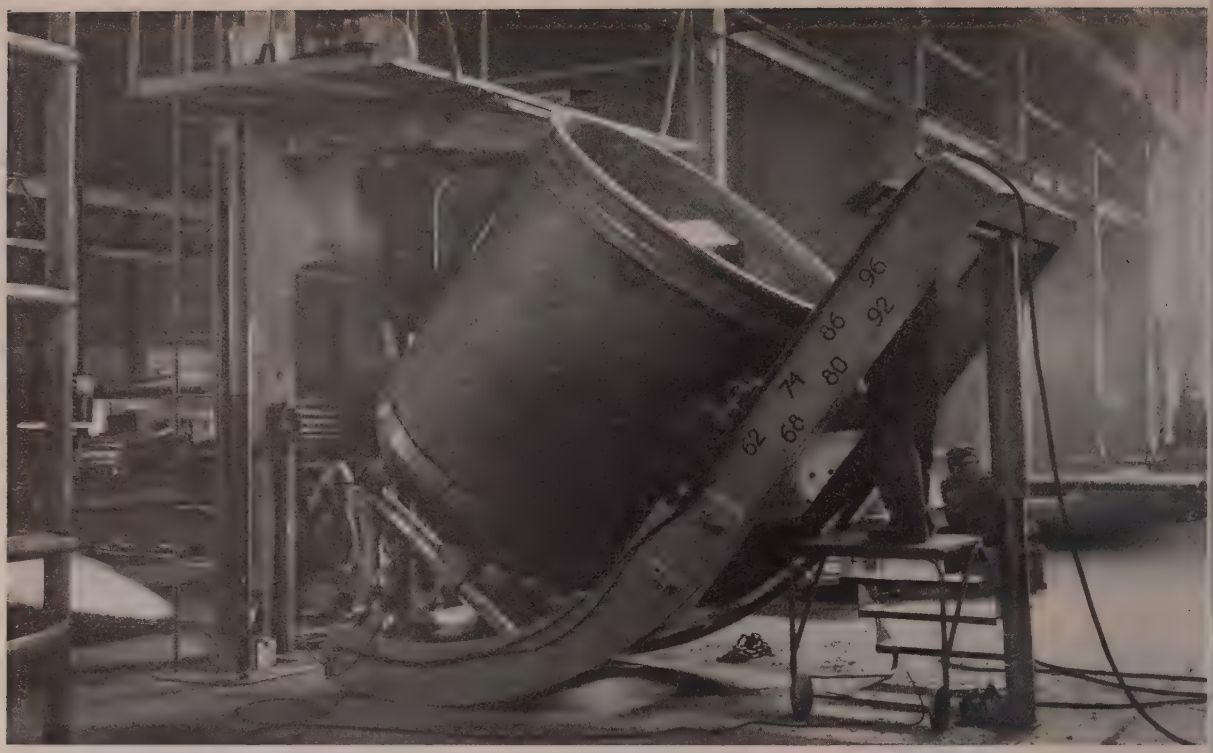
SQUARE D COMPANY

1903 • **50** YEARS OF DESIGN LEADERSHIP • 1953



Rocking positioner is held at desired angle by telescoping strut at right. Tank rests on drive rolls and thrust center, adjustable for different sizes

Tanks Ride Rocking-Horse Weld Positioner

There's no need for uncomfortable weld positions any more. Just lay the vessel on the rack, rock to a convenient working angle, then start the drive rolls and weld away

CONVENIENCE in arc welding, and especially in making girth welds at or near the ends of tanks of medium size, is promoted by use of a new form of positioner dreamed up by engineers of Pfaudler Co., Rochester, N. Y. The company uses it effectively in welding various tanks, some of which they fabricate in considerable numbers.

Partly to facilitate loading and partly to vary the angle at which the tank is inclined for most convenient welding, positioner's channel frame is curved at one end so that rocking on the floor is done easily. At the opposite end, the frame has a hinged telescoping strut with cross pin holes arranged so that, once set at the desired angle, the positioner is supported there by the strut.

Moveable Center — Near the curved end is a rotatable center against which the lower head of the tank rests. This center is on a saddle that slides along a tube in adjusting for tanks of various diameters. Motion of the saddle along the tube is controlled by a cable that runs over a sheave at the end of the tube, thence to a small winch driven by a worm turned by a hand crank.

Close to the center of the frame is a platform carrying a motor-driven rotator having rubber-tired wheels. When a tank rests on these wheels and is tilted to welding position with its lower head against the center, the tank is easily rotated at any speed for which the rotator can be set.

Loads Horizontal — Loading usually is done with the positioner horizontal and the straight portion of the frame on the floor. Generally, the tank is set in place by a traveling crane. When in position, the crane hook is placed in a loop near one end of the strut and the crane then rocks the positioner to the desired angle holding until the strut is adjusted to take the load. This leaves the tank ready for welding.

Welders usually stand on a low platform or sit on a scaffold adjusted to the desired height. If desired, two welds can be made simultaneously, at the high and low sides of the vessel.

Although intended for use in hand arc welding, especially with coated rods, a squirt welder for submerged arc work can be employed readily, either hand-held or set on an adjustable support.

BULLARD

MANUFACTURERS OF MACHINE TOOLS

Wilson Creek Oil Fields, Colorado

Wide World Photo

The Invisible Background of Industrial Progress

Literally "Black Gold from the Clouds" — the Wilson Creek Oil Fields of Colorado, situated 8,378 feet above sea level on the Continental Divide, the highest oil field in the U.S.A.

Manufacturing and maintaining equipment for the drilling and the transportation of oil from the well to the refinery represents a portion of "The Invisible Background of Industrial Progress."

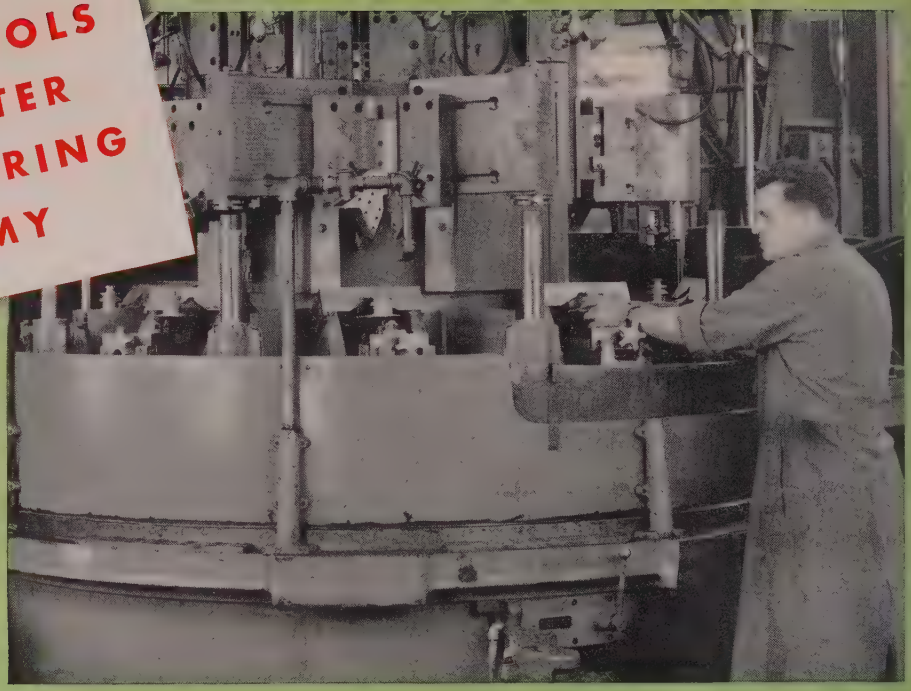
★ The Bullard Company, designers and builders of *Modern Machine Tools,* have consistently pioneered and engineered machines for manufacturing parts and equipment for oil producers and allied industries the world over

★ *For greater manufacturing economy REFER to next page.*

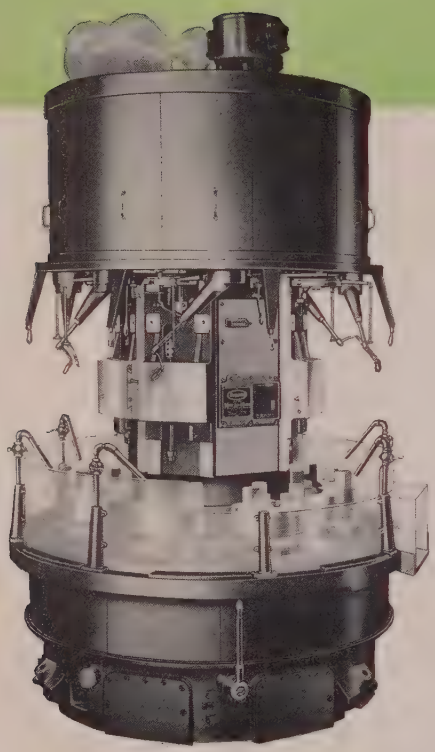
THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

BULLARD MACHINE TOOLS FOR GREATER MANUFACTURING ECONOMY



With a Mult-Au-Matic you have the assurance of consistent and repetitive accuracy to close tolerances on each piece whether the run be large or small.



More than ever before, larger volume of production demands the most efficient methods for machining of identical and interchangeable pieces. The Bullard Mult-Au-Matic way is a proven method.

More than ever before, Bullard Machine Tools meet the requirements of modern industry.

You too can be far ahead — years ahead — in 1953.
Why not find out — get all the facts — let Bullard engineers analyze and assist in your manufacturing problems.

BULLARD

Time saved is money earned. Write now for information on Bullard Mult-Au-Matic.

THE BULLARD COMPANY BRIDGEPORT 2, CONNECTICUT

Market Outlook

DON'T EXPECT the Korean truce to take any great amount of pressure off the demand for steel.

The truce is only that—a truce. While it is a step toward peace it is not a guarantee of permanent peace. We'll have to keep up our guard. Therefore, the U. S. armed services are still planning to spend about $43.2 billion in fiscal 1954, which ends next June 30. This exceeds the $43 billion spent in fiscal 1953 and $39 billion in fiscal 1952.

INDUSTRY'S SHARE—Of the $43.2 billion to be spent in fiscal 1954 the portion going directly to industry will be $17.2 billion, compared with $16.9 billion in fiscal 1953. The $17.2 billion will be spent like this: Navy aircraft, $2.8 billion; Navy shipbuilding, $1.9 billion; Army procurement, $4.9 billion; Air Force aircraft, $6.3 billion; and miscellaneous hard goods, $1.3 billion.

OUTLOOK—The new joint chiefs of staff are mapping plans on which spending in fiscal 1955 will be based, and it looks as though no substantial dollar reduction from fiscal 1954 can be expected.

The big cutbacks for the present time in tanks, vehicles and planes have been made. The U. S. now will engage in replenishing its inventories of defense materiel and keeping up its guard.

THE REAL DANGER—A bigger blow to steel demand could come from civilian industries than from a drop in military expenditures. Defense requirements have strained the supply of some forms of steel, notably large bars, but the automobile industry's steel consumption is by far the largest single determinant of the pace of the steel industry. The auto industry consumes around one-fifth of all of the finished steel produced by U. S. mills.

CAUTIOUS—Consequently, today a lot of eyes are watching the auto industry for a clue as to how things will go. That industry is still voicing optimism, yet it is playing its cards cautiously. It is not yet willing to sign up for conversion steel (a costly product) for fourth-quarter delivery, but neither is it willing to close the door against it. Indicative of the auto industry's caution is its withholding of orders for parts after October. Ordinarily, suppliers would have orders now for November and December.

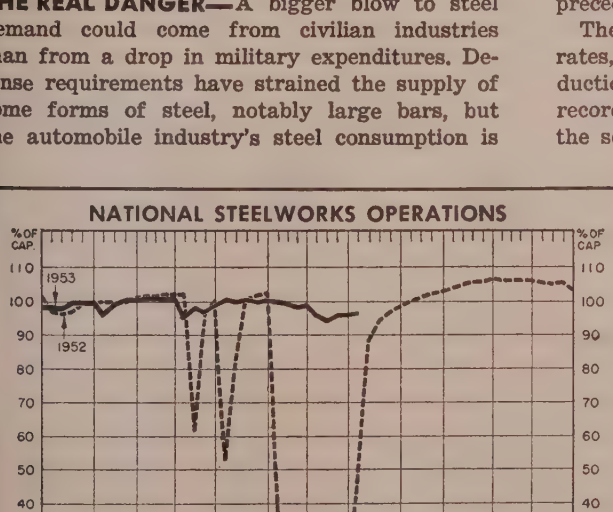
Fast pace of the auto industry is helping keep demand heavy for cold-rolled carbon steel sheets. Other steel products in tight supply are heavy plate, large carbon bars, structurals and seamless tubing. Nevertheless, demand for even these products is not as frantic as it was some months ago.

NO LET-DOWN—Furthermore, the steel industry has been utilizing its facilities to the limit. Even summer vacations have left little impression on the production pace. The ingot production rate this summer has been consistently at or above 95 per cent of capacity.

FASTER—In the week ended Aug. 1, STEEL's rate of ingot production rose 0.5 point over the preceding week to 96.5 per cent of capacity.

The increase in capacity and high operating rates, which have carved out many new production records, are being reflected in new records in steel company sales and earnings for the second quarter and first half of 1953.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Aug. 1	Change	Same 1952	Week 1951
Pittsburgh	97	+ 1	35.5	95.6
Chicago	95	— 4.5*	53	103
Mid-Atlantic	97.5	0	43.5	101
Youngstown	105	— 1	45	105
Wheeling	99	0	47.5	97.5
Cleveland	105	+ 5.5	40.5	103
Buffalo	106.5	0	51	104
Birmingham	100	0	15	100
New England	89	+41	53	92
Cincinnati	90.5	— 0.5	55	106
St. Louis	93	+ 7.5*	96.5	95
Detroit	102	— 5	73	102
Western	107.5	+ 3.5	36	101.5
Estimated National Rate	96.5	+ 0.5	43	102

*Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

The Metalworking Outlook—p. 41 Technical Outlook—p. 97

Composite Market Averages

FINISHED STEEL PRICE INDEX: Bureau of Labor Statistics	July 28 1953	July 21 1953	Month Ago	July Average
(1947-1949=100)	141.7	141.7	141.2	141.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended July 28, 1953

Units are 100 lb except where otherwise noted.

Rails, standard No. 1	$4.400	Sheets, electrical grade	$9.017
Rails, light, 40 lb	5.767	Strip, C.R. carbon	7.371
Plates, carbon	4.550	Strip, C.R. stainless, 430, (lb)	0.415
Structural Shapes	4.383	Strip, H.R. carbon	5.113
Bars, tool steel (lb)	1.730	Pipe, black, buttweld (100 ft)	14.454
Bars, H.R. alloy	8.675	Pipe, galv., buttweld (100 ft)	17.895
Bars, H.R. stainless, 303, (lb)	0.418	Casing, oil well, zcarbon (100 ft)	149.516
Bars, H.R. carbon	4.850	Tin Plate, hot-dipped, 1.25 lb.	8.433
Bars, reinforcing	4.775	Tin Plate, electrolytic, 0.25 lb.	7.133
Bars, C.F. carbon	7.860	Black Plate, can making	6.233
Bars, C.F. alloy	11.075	Wire, carbon, 8 gage	7.713
Sheets, H.R. carbon	4.765	Wire, stainless, 430, (lb)	0.542
Sheets, C.R. carbon	5.904	Bale Ties (bundle)	5.653
Sheets, galvanized	7.015	Nails, wire, 8d common	7.530
Sheets, C.R. stainless, 302, (lb)	0.548	Wire, barbed (80 rod spool)	6.847
		Woven Wire Fence (20 rod roll)	16.174

FINISHED STEEL PRICE INDEX, Weighted: Calculated by STEEL*	July 30 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.38	189.38†	187.73	181.31	143.08
Index in cents per lb.	5.130	5.130†	5.086	4.912	3.876

ARITHMETICAL PRICE COMPOSITES: Calculated by STEEL*					
Finished Steel NT	$115.56	$115.56†	$114.53	$106.32	$95.05
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	52.54	42.20
Basic Pig Iron, GT	56.04	56.04	56.00	52.16	42.01
Malleable Pig Iron, GT	57.27	57.27	57.27	53.27	42.60
Steelmaking Scrap, GT	43.92	43.42	43.17	43.00	41.67

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	July 30 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.70	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.70	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.252	3.79
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.55	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.65	3.25
Shapes, Std., Chicago	4.10	4.10	4.10	3.65	3.25
Shapes, del., Philadelphia	4.38	4.38	4.38	3.93	3.48
Plates, Pittsburgh	4.10	4.10	4.10	3.70	3.50
Plates, Chicago	4.10	4.10	4.10	3.70	3.40
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.70	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.15	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.60-75	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.60	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.35	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.35	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.55	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	4.80	4.40
Strip, H.R., Pitts.	3.975-4.425	3.975-4.425	3.975-4.425	3.75-4.00	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.50	3.275
Strip, C.R., Pittsburgh	5.45-5.95	5.45-5.95	5.45-5.95	4.65-5.35	4.00
Strip, C.R., Chicago	5.70	5.70	5.70	4.90	4.125
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	4.85-5.60	4.20
Wire, Basic, Pitts.	5.475-5.525	5.475-5.525	5.475-5.525	4.85-5.10	4.15
Nails, Wire, Pittsburgh	6.35-6.55	6.35-6.55	6.35-6.55	5.90-6.20	5.15
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.70	$6.70
SEMIFINISHED					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$66.00	$61.00
Wire rods, ½-⅝", Pitts.	4.525	4.525	4.525	4.10-30	3.45
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$53.00	$47.00
Basic, Valley	56.00	56.00	56.00	52.00	43.00
Basic, del. Phila.	60.75	60.75	60.75	56.75	46.17
No. 2 Fdry, Pitts.	56.50	56.50	56.50	52.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	52.50	43.25
No. 2 Fdry, Valley	56.50	56.50	56.50	52.50	43.50
No. 2 Fdry, del. Phila.	61.25	61.25	61.25	57.25	46.67
No. 2 Fdry, Birm.	52.88	52.88	52.88	48.88	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	56.43	49.09
Malleable, Valley	56.50	56.50	56.50	52.50	43.50
Malleable, Chicago	56.50	56.50	56.50	52.50	43.50
Ferromanganese, Etna, Pa.	200.00†	200.00†	200.00†	188.00*	148.00*

*78-82% Mn, per gross ton. †74-76% Mn, per net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$44.50	$44.50	$44.50	$44.00	$42.75
No. 1 Heavy Melt, E. Pa.	44.25	44.25	43.50	42.50	45.50
No. 1 Heavy Melt, Chicago	43.50	41.50	41.50	42.50	41.75
No. 1 Heavy Melt, Valley	45.50	45.50	45.50	44.00	42.75
No. 1 Heavy Melt, Cleve.	45.50	45.50	43.50	43.00	42.25
No. 1 Heavy Melt, Buffalo	43.75	43.75	40.75	37.00	46.25
Rails, Rerolling, Chicago	55.50	54.50	50.00	52.50	64.25
No. 1 Cast, Chicago	41.00	41.00	40.00	45.00	70.00
COKE, Net Ton					
Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.25
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	23.00	20.40

PIG IRON

F.o.b. furnace prices as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies on page 149.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$58.00	$58.50	$59.00	$59.50
New York, del.	....	62.23	62.78	....
Newark, del.	61.02	61.52	62.02	62.52
Philadelphia, del.	60.75	61.25	61.75	62.25
Birmingham District				
AlabamaCity, Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward, Ala. W15	52.38	52.88	....	....
Cincinnati, del.	....	60.43	....	....
Buffalo District				
Buffalo R2	56.00	56.50	57.00	....
Buffalo H1	56.00	56.50	57.00	....
Tonawanda, N.Y. W12	56.00	56.50	57.00	....
No. Tonawanda, N.Y. T9	....	56.50	57.00	....
Boston, del.	66.65	67.15	67.65	....
Rochester, N.Y., del.	59.02	59.52	60.02	....
Syracuse, N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary, Ind. U5	56.00	....	56.50	....
IndianaHarbor, Ind. I-2	56.00	....	56.50	....
So. Chicago, Ill. W14	56.00	56.50	56.50	....
So. Chicago, Ill. Y1	56.00	56.50	56.50	....
So. Chicago, Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon, Mich., del.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron, O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain, O. N3	56.00	....	....	57.00
Duluth I-3	....	....	56.50	....
Erie, Pa. I-3	56.00	56.50	56.50	57.00
Everett, Mass. E1	....	63.25	63.75	....
Fontana, Calif. K1	62.00	62.50	....	....
Geneva, Utah C11	*57.50*	*58.00*	....	....
GraniteCity, Ill. G4	57.90	58.40	58.90	....
Ironton, Utah C11	56.00	56.50	....	....
Lone Star, Texas L6	52.00	52.50*	52.50	....
Minnequa, Colo. C10	58.00	59.00	59.00	....
Rockwood, Tenn. T3	....	....	58.50	....
Pittsburgh District				
NevilleIsland, Pa. P6	56.00	56.50	56.50	....
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	57.37	57.87	57.87	....
McKeesRocks, del.	57.04	57.54	57.54	....
Lawrenceville, Homestead, Wilmerding, Monaca, del.	57.66	58.16	58.16	....
Verona, Trafford, del.	58.19	58.69	58.69	....
Brackenridge, del.	58.45	58.95	58.95	....
Bessemer, Pa. U5	56.00	....	56.50	57.00
Clairton, Rankin, So. Duquesne, Pa. U5	56.00	....	....	....
McKeesport, Pa. N3	56.00	....	....	57.00
Midland, Pa. C18	56.00	....	....	....
Monessen, Pa. P7	56.00	....	....	....
Sharpsville, Pa. S6	56.00	56.50	56.50	57.00
Steelton, Pa. B2	58.00	58.50	59.00	59.50
Swedeland, Pa. A3	60.00	60.50	61.00	61.50
Toledo, O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....
Troy, N. Y. R2	58.00	58.50	59.00	....
Youngstown District				
Hubbard, O. Y1	....	....	56.50	....
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....		57.00
Mansfield, O., del.	60.90	....	61.40	61.90

*Low phos, southern grade

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson, O. G2, J1	$67.
Buffalo H1	68.

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls, N.Y. P15	$91.
Keokuk, Iowa, Openhearth & Fdry, freight allowed K2	95.
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frt. allowed K2	98.
Wenatchee, Wash., OH & Fdry, freight allowed K2	95.

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.
Rockwood, Tenn. T3	68.
Steelton, Pa. B2	64.
Philadelphia, delivered	67.
Troy, N.Y R2	64.

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NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary & Secondary Metals

Copper: Electrolytic 29.75-30.00c, Conn. Valley; Lake 30.125c; foreign electrolytic, deld., 29.75-30.00c.

Brass Ingots: 85-5-5-5 (No. 115) 24.50c; 88-10-2 (No. 215) 34.00c; 80-10-10 (No. 305) 28.75c; No. 1 yellow (No. 405) 25.25c.

Zinc: Prime western 11.00c; brass special 11.25c; intermediate 11.50c; East St. Louis. Prime western 11.25-11.50c, brass special 11.50-11.75c, intermediate 11.75-12.00c, high grade 12.35-12.85c, special high grade 12.50-13.00c, delivered.

Lead: Common 13.80c; chemical 13.90c; corroding 13.90c; St. Louis.

Primary Aluminum: 99% plus, ingots 21.50c; pigs 20.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 22.75-23.50c; No. 12 foundry alloy (No. 2 grade) 22.00-23.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75-24.00c; grade 2, 23.00-23.25c; grade 3, 22.00-22.25c; grade 4, 21.00-22.00c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 27.00c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt RFC, 121.50c; outside market 79.75c.

Antimony: American 99-99.8% and over but not meeting specifications below 34.50c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 35.00c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 60.00c; 25-lb pigs 62.65c; "XX" nickel shot, 63.65c; "F" nickel shot or ingots, for addition to cast iron, 60.00c. Prices include import duty.

Mercury: Open market, spot, New York, $191-$194, per 76-lb flask.

Cadmium: "Regular" straight or flat forms, $2 deld.; special or patented shapes $2.15.

Beryllium-Copper: 3.75-4.25% Be, $40.00 per lb of contained beryllium, with balance as copper at market price on date of shipment, f.o.b. Reading, Pa., or Elmore, O.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open-market, New York 85.25c per oz.

Platinum: $93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $165-$175 per troy ounce.

Titanium: (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Cents per pound, f.o.b. mill, effective Apr. 1, 1953. Listings are lowest quotations.)

Sheet: Copper 50.48; yellow brass 42.87; commercial bronze, 95% 49.89; 90% 48.76; red brass, 85% 47.11; 80% 45.99; best quality, 44.43; nickel silver, 18%, 59.84; phosphor-bronze grade A, 5%, 70.50.

Rod: Copper, hot-rolled 46.83; cold-drawn 48.08; yellow brass free cutting, 36.68; commercial bronze 95% 49.58; 90% 48.45; red brass 85%, 46.80; 80%, 45.68.

Seamless Tubing: Copper 50.42; yellow brass 45.78; commercial bronze, 90%, 51.32; red brass, 85%, 49.92.

Wire: Yellow brass 43.16; commercial bronze, 95%, 50.18; 90%, 49.05; red brass, 85%, 47.40; 80%, 46.28; best quality brass, 44.72.

(Base prices effective July 11, 1953)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb. 36.53; l.c.l., 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l., 42.58.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective July 20, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— 11S-T3	17S-T4	—Hexagonal— 11S-T3	17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $19.00 per cwt; add 50c per cwt for 100 sq ft to 140 sq ft. Pipe: Full coils $19.00 per cwt. Traps and bends: List prices plus 30%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.75-21.75c; over 12-in. 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill effective Mar. 9, 1953) Sheets, cold-rolled 86.50c. Strip, cold-rolled 92.50c. Rods and shapes, 82.50c. Plates, 84.50c. Seamless tubes 115.50c.

MONEL

(Base prices f.o.b. mill effective July 1, 1953) Sheets, cold-rolled 67.50c. Strip, cold-rolled 70.50c. Rods and shapes, 65.50c. Plates 66.50c. Seamless tubes, 100.50c. Shot and blocks, 60.00c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter less than 25 lb 58.00c-65.00c; 25 to 99 lb, 48.00c-55.00c; 100 lb to 5000 lb, 44.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 42.18c; oval 41.68c.

Nickel Anodes: Rolled, oval, carbonized, carloads 81.00c; 5000 to 29,999 lb, 83.00c; 500 to 4999 lb, 85.00c; 1 to 499 lb, 89.00c, f.o.b. Cleveland.

Nickel Chloride: In 100 lb bags; 10,000 lb and over, 37.00c; 5000 to 9900 lb, 38.00c; 400 to 4900 lb, 40.00c; 300 lb, 42.00c; 200 lb, 43.00c; 100 lb, 45.00c, f.o.b. Cleveland.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 64.4c per lb; 100 to 350 lb drums only, 100 to 600 lb 50.5c; 700 to 1900 lb, 48c; 2000 to 9900 lb, 46.2c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers. Based on 79-cent tin.

Tin Anodes: Bar, 1000 lb and over, 95c; 500 to 999 lb, 95.5c; 200 to 499 lb 96c; less than 200 lb, 97.5c. Freight allowed east of Mississippi and north of Ohio and Potomac. Based on 79-cent tin.

Stannous Sulphate: 100 lb kegs or 400 lb bbl less than 2000 lb 86.8c; more than 2000 lb, 84.8c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers. Based on 79-cent tin.

Stannous Chloride (Anhydrous): In 400 lb bbl. 97c; 100 lb kegs 99.4c, f.o.b. Carteret, N. J., freight allowed on 100 lb or more. Based on 79-cent tin.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c; f.o.b. Niagara Falls, N. Y.

Scrap Metals

Brass Mill Allowances

(Prices in cents per pound for less than 20,000 pounds, f.o.b. shipping point; on lots over 20,000 pounds at one time of any or all kinds of scrap, add 1 cent per pound.)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	28.625	28.625	27.875
Yellow Brass	21.375	21.125	19.625
Commercial Bronze 95%	27.250	27.000	26.500
90%	26.125	25.875	25.375
Red Brass 85%	25.125	24.875	24.375
80%	24.125	23.875	23.375
Best Quality (71-80%)	22.500	22.250	21.750
Muntz metal	20.000	19.750	19.250
Nickel silver, 10%	25.250	25.000	12.625
Phos. Bronze, A	30.625	30.375	29.375
Naval Brass	20.000	19.750	19.250
Manganese Bronze	20.000	19.750	19.250

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 22.50-23.00; No. 2 copper 21.00; light copper 19.50; refinery brass (60% copper) per dry copper content 19.00.

INGOT MAKERS' COPPER AND BRASS SCRAP BUYING PRICES

(Cents per pound, carlots, delivered)

No. 1 copper 23.50; No. 2 copper, 21.50; light copper 20.50; No. 1 composition borings 16.00-16.50; No. 1 composition solids, 17.00-17.50; radiators 13.00; heavy yellow brass solids, 14.00; yellow brass turnings 13.00.

SMELTERS' BUYING PRICES FOR SCRAP ALUMINUM

(Carlots, delivered)

2S aluminum clippings, 16.00-17.00c; mixed clipping, 14.50-15.50c, old aluminum sheet, 14.00-14.50c; old aluminum cast, 13.00-13.50; borings and turnings, 13.50-14.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 23.00; No. 2 copper 20.00; light copper 18.00; No. 1 composition red brass 17.00; No. 1 composition turnings 16.50; mixed brass turnings 10.00; new brass clippings 17.50; No. 1 brass rod turnings 16.00; light brass 10.00; heavy yellow brass 12.50; new brass rod ends 16.50; auto radiators, unsweated 13.00; cocks and faucets 15.00; brass pipe 16.00.

Aluminum: Clippings 2S 14.00; old sheets 10.00; crankcase 10.00; borings and turnings 7.50; pistons and struts 7.50.

Tin: No. 1 pewter 37.00-45.00; block tin pipe 60.00-65.00; No. 1 babbitt 35.00-40.00.

Lead: Heavy 11.00-11.50; battery plate 6.25-6.50; linotype and stereotype 13.25; electrotype 11.50; mixed babbitt 12.00-12.50.

Zinc: Old zinc, 4.50; new die cast scrap, 4.50; old die cast scrap, 3.50.

Nickel: Sheets and clips $1.00; rolled anodes $1.00; turnings 85.00c; rod ends $1.00.

Monel: Clippings 33.00; old sheet 30.00; turnings 25.00; rods 33.00.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
July 29-30	29.75-30.00	13.80	11.00	79.75	21.50	34.50	60.00	85.25
July 28	29.75-30.00	13.80	11.00	79.25	21.50	34.50	60.00	85.25
July 27	29.75-30.00	13.80	11.00	78.75	21.50	34.50	60.00	85.25
July 24-25	29.75-30.00	13.80	11.00	80.25	21.50	34.50	60.00	85.25
July 23	29.75-30.00	13.80	11.00	79.75	20.50-21.50	34.50	60.00	85.25
July 22	29.75-30.00	13.55	11.00	78.75	20.50-21.50	34.50	60.00	85.25
July 21	29.75-30.00	13.55	11.00	78.25	20.50-21.50	34.50	60.00	85.25
July 20	29.75-30.00	13.55	11.00	79.75	20.50-21.50	34.50	60.00	85.25
July 17-18	29.75-30.00	13.30	11.00	80.75	20.50-21.50	34.50	60.00	85.25
July 15-16	29.75-30.00	13.30	11.00	80.50	20.50-21.50	34.50	60.00	85.25
July 14	29.75-30.00	13.30	11.00	81.00	20.50	34.50	60.00	85.25
July 13	29.75-30.00	13.30	11.00	82.00	20.50	34.50	60.00	85.25
July 8-11	29.75-30.00	13.30	11.00	83.00	20.50	34.50	60.00	85.25
July 7	29.75-30.00	13.30	11.00	82.75	20.50	34.50	60.00	85.25
July 6	29.75-30.00	13.30	11.00	84.75	20.50	34.50	60.00	85.25
June Avg.	29.875	13.213	11.00	92.918	20.50	34.50	60.00	85.25

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9% base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Nonferrous Metals

Drop in copper prices is apt to come at any minute now. Here are five reasons why you can look for it, and also an explanation why a decline has been so long in coming

COPPER PRICES are riding for a fall. The break could start this week, will surely come before the month is out.

Of course, that's what many market men were saying 90 days ago and it hasn't happened yet. They're still saying it though, and wondering why copper has held so long at the 30-cent level.

Market Factors — Combining in varying degrees to point to lower prices ahead are these factors:

1. Private trading in copper begins Aug. 5 on the London Metal Exchange for the first time since 1939. A more normal world supply-demand relationship will be mirrored here. Priming the market, but not unloaded, will be 75,000 tons of U. K. government copper.

2. Imports have boomed in recent months. Combined with steady but unspectacular rise in U. S. production from expansion programs it spells comfortable supplies ahead.

3. Brass and wire mills' competition for business is sharpening and fabricators note a slackening in defense orders. They'll be shopping around more closely for bargain copper.

4. Big fabricators are cutting inventory to the bone in anticipation of a lower price, which in itself could hasten the drop.

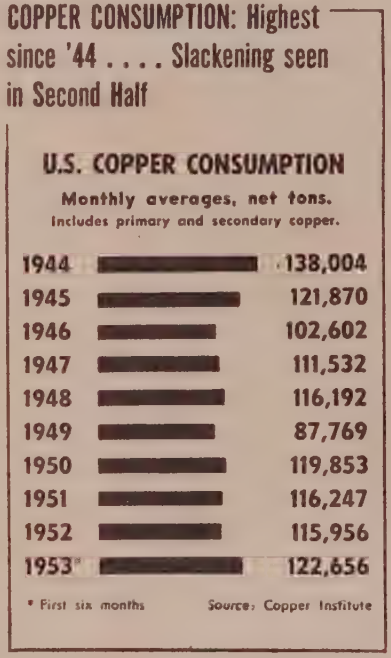
5. Price cutting is back, though presently confined to small lots of resale wire bars at 29.50 cents, which isn't much of a concession. Scrap market is soft as putty, with little buying and prices nominal. Reductions started last week.

Counterbalance — Three reasons stand out in explaining copper's price tenacity. First is continued fair demand from industry for copper and its alloys. Fourth-quarter business won't be as good as it has been, but it won't be bad by any means. Second is possibility of a copper strike and near-certainty of higher wages for miners. A strike isn't likely now, but wage concessions must be considered in pricing.

Third is the withholding of Chilean copper from the market. At least 60,000 tons of the red metal has been stacked up in South America—unsold at the 35.5-cent asking price. Signs indicate Chile's government is getting restless to move the metal. It wants the U. S. to buy unsold metal for stockpile before it will bring prices down to world levels.

A hassle has been going on over threats to sell copper to Iron Curtain countries, but it means little.

COPPER CONSUMPTION: Highest since '44 . . . . Slackening seen in Second Half



Brass Ingot Market Slow

Brass ingot market, which often gives portent of things to come in copper, is still in the doldrums. Price reductions of 0.25 to 3.50 cents came last week, the third round since decontrol. Ingots are now as much as 6 cents below OPS ceilings. Deepest slice came in the tin-containing 88-10-2 group. Sharp drop in tin prices was the reason given for ingot reductions; actually business is just off, and further cuts are possible.

No. 115 grade is down 1.5 to 24.50, No. 225 down 0.75 to 35.25, No. 245 down 0.75 to 29.50, No. 305 down 1.25 to 28.75, No. 405 yellow brass down 0.50 to 20.75 and No. 421 manganese bronze down 1.25 to 20.75.

Price Increases Analyzed

Increase in aluminum mill product prices won't hurt as much as some users imagined. In 2S and 3S sheet, flat sheet base advanced 1 to 1.3 cents a pound while coiled sheet base moved up 0.9 to 1.2 cents and coiled sheet circle base was hiked 1.2 to 1.5 cents. Various sizes are now regarded as carrying their own weight more proportionately pricewise. In screw machine stock this trend is more pronounced, with 11S-T3 advancing 0.5 to 1.3 cents in rounds and 0.9 to 1.5 cents in hex shapes, while 17S-T added 0.5 to 1.2 cents in rounds and 0.9 to 1.2 cents in hexes.

Alloy ingot advanced less than a cent in most cases ranging from 0.5 for alloys 13, A13, 43, 355 and 356 to 0.9 cents for alloys 195 and B195 and 1 cent for alloy 142. In richer alloys, 1 per cent magnesium was reduced by 0.8 cents, while 25 per cent nickel alloy went up 2.6 cents and iron alloys up 0.8 cents. Quantity extras also went up on orders under 500 pounds and 0.5 cents on orders from 500 to 1999 pounds.

Foil base went up 1.5 cents on sizes up to 0.001-inch, and 2 cents above that size. Brazing sheet advanced 1.9 to 2.1 cents. Plate and circle base is up 2 cents for 61S-T and 75S-T6, 1.5 cents for other alloys. Rises have also been posted on structural shapes, extruded and drawn tube, wire, rod and bar, electrical conductor and wire and cable accessories.

Nonferrous Briefs

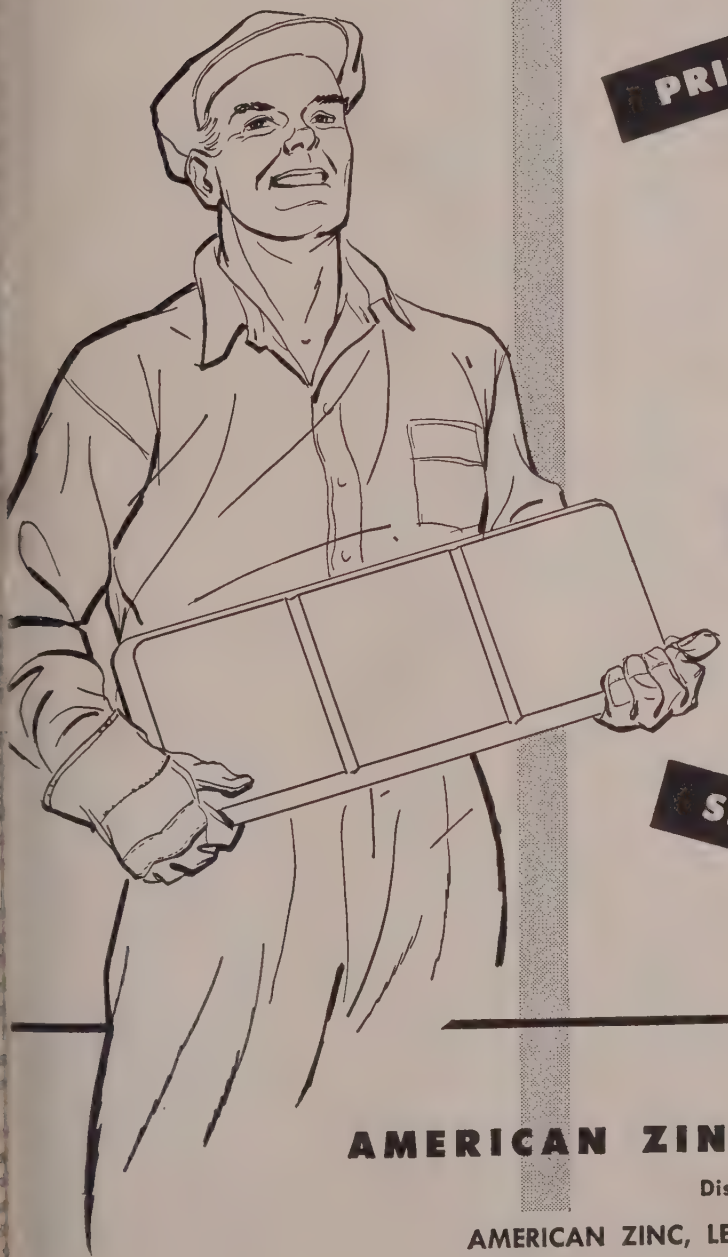
- Lead demand is still good after two price advances last month, to 17 cents a pound. Battery plates are moving so well that smelting charge rose to $50 a ton.
- Zinc uncertainty hasn't been resolved; three separate pricing structures still exist.
- Tin rallied briefly after almost falling below the pre-Korea price, but wide daily fluctuations are common place.
- Dow Chemical Co.'s magnesium sales were up 33 per cent in the year ended May 31; the company spent $5 million on new construction in its fields in fiscal 1953, plans to spend $75 million in fiscal 1954.
- Shipments of wrought aluminum products this year are running 33 per cent higher than last year.
- Secondary aluminum business is cruising along at steady volume, but ingot makers hope scrap prices will ease as their profit margin is narrowing. Increases in primary aluminum prices aren't expected to be felt until the new metal works its way through the scrap cycle.

every grade of ZINC

for urgent military and

civilian requirements

SLAB ZINC



PRIME WESTERN

SELECT

BRASS SPECIAL

INTERMEDIATE

HIGH GRADE

SPECIAL HIGH GRADE

AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 149. Key to footnotes, page 151.

—SEMIFINISHED—

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$56.00
Munhall,Pa U5 .....59.00

INGOTS Alloy (NT)
Detroit R7 .....$63.00
Fontana,Calif. K1 ....58.00
Midland,Pa. C18 ... 62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS Carbon Rerolling (NT)
Aliquippa,Pa. J5 ....$62.50
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 ....62.00
Fontana,Calif. K1 ....62.00
Gary,Ind U5 .....62.00
Johnstown,Pa. B2 ....62.00
Lackawanna,N.Y. B2 ..62.00
Munhall,Pa. U5 .....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 ....75.50
Buffalo R2 .....75.50
Canton,O. R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3 ..82.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield,Ala. T2 ....75.50
Fontana,Calif. K1 ....94.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 ....75.50
Houston S5 .....85.50
Johnstown,Pa. B2 ....75.50
Lackawanna,N.Y. B2 ..75.50
LosAngeles B3 .....94.50
Munhall,Pa. U5 .....75.50
Seattle B3 .....94.50
So.Chicago R2,U5,W14..75.50
So.Duquesne,Pa. U5 ..75.50
So.SanFrancisco B3 ..94.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton,O. R2 .....82.00
Canton,O. T7 .....84.60
Conshohocken,Pa. A3 ..89.00
Detroit R7 .....85.00
Fontana,Calif. K1 ..101.00
Gary,Ind. U5 .....82.00
Houston S5 .....92.00
Ind.Harbor,Ind. Y1 ....82.00
Johnstown,Pa. B2 ....82.00
Lackawanna,N.Y. B2 ..82.00
LosAngeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2,U5,W14..82.00
So.Duquesne,Pa. U5 ...82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$87.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ..113.50
Gary,Ind. U5 .....92.50
Massillon,O. R3 ....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ..92.50

SHEET BAR (NT)
Fontana,Calif. K1 ....$93.18

SKELP
Aliquippa,Pa. J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O R2 .....3.75
Youngstown R2, U5 ...3.75

WIRE RODS
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
AlabamaCity,Ala. R2..4.525
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 ....4.525
Fontana,Calif. K1 ....5.325
Johnstown,Pa. B2 ....4.525
Houston S5 .....4.925
Minnequa,Colo. C10 ..4.775
Monessen,Pa. P7 .....4.725
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ...4.865
LosAngeles B3 .....5.325
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif. C11 ..5.175
Portsmouth,O. P12 ...4.725
Roebling,N.J. R5 ....4.425
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2 4.625
Sterling,Ill.(1) N15 ..4.525
Struthers,O. Y1 .....4.525
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.525

—STRUCTURALS—

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Bethlehem,Pa. B2 .....4.15
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.60
Ind.Harbor,Ind. I-2 ....4.10
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.80
Lackawanna,N.Y. B2 ...4.15
LosAngeles B3 .....4.80
Minnequa,Colo. C10 ....4.55
Munhall,Pa. U5 .....4.10
Niles,Calif.(22) P1 ....4.91
Phoenixville,Pa. P4 ....4.95
Seattle B3 .....4.85
So.Chicago,Ill. U5, W14 4.10
So.SanFrancisco B3 ....4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 ....4.35

Wide Flange
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....5.30
Lackawanna,N.Y. B2 ...4.15
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 ....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.40
Gary,Ind. U5 .....5.00
Munhall,Pa. U5 .....5.00
So Chicago,Ill. U5 .....5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer,Ala. T2 .....6.175
Bethlehem,Pa. B2 .....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 ....6.825
Gary,Ind. U5 .....6.175
Geneva,Utah C11 .....6.175
Ind.Harbor,Ind I-2 ...6.175
Ind.Harbor,Ind Y1 ...6.675
Johnstown,Pa B2 .....6.20
Lackawanna,N.Y. B2 ...6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 .....6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ...6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill. U5 ....6.125

BEARING PILES
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 ....4.10

—PILING—

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ...4.925
Lackawanna,N.Y. B2 ...4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 ....4.925

—PLATES—

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky. (15) A10 ..4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del C22 ....4.55
Cleveland J5 R2 .....4.10
Coatesville,Pa L7 .....4.35
Conshohocken,Pa. A3 ..4.55
Ecorse,Mich G5 .....4.65
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1..4.75
Gary,Ind. U5 .....4.10
GraniteCity,Ill. G4 ....4.60
Geneva,Utah C11 .....4.10
Harrisburg,Pa. C5 .....6.50
Houston S5 .....4.60
Ind.Harbor,Ind I-2, Y1 4.10
Johnstown,Pa B2 .....4.10
Lackawanna,N.Y. B2 ..4.10
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale,Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon,Pa. S3 .....4.10
So.Chicago,Ill. U5, W14 4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville,O. W10 ...4.10
Warren,O. R2 .....4.10
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5, Y1 4.10

PLATES, Carbon A.R.
Fontana,Calif. K1 ....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 .....9.30

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala. T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland R2 .....5.95
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.50
Ecorse,Mich. G5 .....7.10
Fairfield,Ala. T2 .....6.25
Fontana,Calif.(30) K1..6.95
Gary,Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ...6.25
Ind.Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 .....6.25
Lackawanna,N.Y. B2 ...6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon Pa. S3 .....6.25
So.Chicago,Ill, U5, W14.6.25
SparrowsPoint,Md. B2..6.25
Warren,O. R2 .....5.95
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del C22 ....5.65
Coatesville,Pa. L7 ....5.75
Fontana,Calif. K1 ....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5, W14 5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken,Pa. A3 ..5.15
Ind.Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 .....5.15
So.Chicago,Il. U5 .....5.15

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ..4.35
Ashland,l.c.l. (15) A10..4.85
Cleveland,c.l. 4.70
Warren,O. c.l. R2 ....4.70

—BARS—

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..4.15
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.45
Bessemer,Ala. T2 .....4.15
Buffalo R2 .....4.15
Clairton,Pa. U5 .....4.15
Cleveland R2 .....4.15
Detroit R7 .....4.30
Ecorse,Mich. G5 .....4.50
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fontana,Calif. K1 ....4.85
Gary,Ind. U5 .....4.15
Houston S5 .....4.65
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.85
Lackawanna,N.Y. B2 ...4.15
LosAngeles B3 .....4.85
Milton,Pa. B6 .....4.65
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y.B11 ..4.15
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
Portland,Oreg. G4 .....4.90
Seattle B3, N14 .....4.90
So.Chicago R2, U5, W14 4.15
So.Duquesne,Pa. U5 ....4.15
So.SanFran.,Calif. B3..4.90
Sterling,Ill. N15 .....4.75
Struthers,O Y1 .....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 ....4.30
Youngstown R2, U5 ....4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.875
Buffalo R2 .....4.875
Canton,O. T7 .....5.02
Canton,O. R2 .....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....5.025
Ecorse,Mich. G5 .....5.225
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....4.875
Houston S5 .....5.375
Ind Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 .....4.875
KansasCity,Mo. S5 ....5.575
Lackawanna,N.Y. B2..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2, U5,W14 4.875
So.Duquesne,Pa. U5 ..4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.225
Bessemer,Ala. T2 .....6.225
Bethlehem,Pa. B2 .....6.225
Clairton,Pa. U5 .....6.225
Cleveland R2 .....5.925
Ecorse,Mich G5 .....6.875
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 ....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. I-2, Y1 6.225
Johnstown,Pa. B2 .....6.225
Lackawanna,N.Y. B2 ...6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6.225
So.Duquesne,Pa. U5 ..6.225
So.SanFrancisco B3 ..6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES;H.R.CARBON
Bethlehem,Pa. B2 .....4.35

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.45
Houston S5 .....5.70
KansasCity S5 .....5.90
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 ....6.00
Gary,Ind. U5 .....5.00
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.20
BeaverFalls,Pa. M12. R2 5.20
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 .....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ..5.20
Gary,Ind. R2 .....5.20
GreenBay, Wis. F7 ....5.185
Hammond,Ind. L2, M13.5.20
Hartford,Conn. R2 .....5.75
Harvey,Ill. B5 .....5.20
LosAngeles R2 .....6.65
Mansfield,Mass. B5 ....5.75
Massillon,O. R2, R8 ...5.20
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 .....5.70
NewCastle,Pa. B4 .....5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 ....5.45
Putnam,Conn. W18 .....5.85
Readville,Mass. C14 ....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ...6.10
Youngstown F3, Y1 .....5.20

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19.4.45

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....6.325
BeaverFalls,Pa. M12 ...6.325
Bethlehem,Pa. B2 .....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. B2 .....6.325
Canton,O. T7 .....6.29
Carnegie,Pa. C12 .....6.00
Chicago W18 .....6.325
Cleveland A7, C20 .....6.325
Detroit P17, R7 .....6.45
Detroit B5 .....6.55
Donora,Pa A7 .....6.35
Elyria,O. W8 .....6.35
Gary,Ind. R2 .....6.35
Hammond,Ind L2, M13 6.35
Hartford,Conn R2 .....6.75
Harvey,Ill B5 .....6.35
Ecorse,Mich. G5 .....6.55
Fontana,Calif. K1 ....6.95
Gary,Ind. U5 .....6.45
Houston S5 .....6.55
Massillon,O R2, R8 ...6.35
Midland,Pa. C18 .....6.45
Monaca Pa S17 .....6.35
Newark,N.J W18 .....6.45
Plymouth,Mich. P5 ....6.55
So.Chicago,Ill. R2, W14 6.35
SpringCity,Pa. K3 ....6.45
Struthers,O. Y1 .....6.55
Warren,O. C17 .....6.35
Waukegan,Ill. A7 .....6.35
Worcester,Mass. A7 ...6.60
Youngstown F3, Y1 ..6.35

BARS, Reinforcing (Fabricate
AlabamaCity,Ala. R2 ..4
Atlanta A11 4
Buffalo R2 4
Cleveland R2 4
Emeryville,Calif. J7 ...4
Fairfield,Ala. T2 4
Fontana,Calif. K1 4
Gary,Ind. U5 4
Houston S5 4
Ind.Harbor,Ind. I-2 4
Johnstown,Pa. B2 4
KansasCity,Mo. S5 4
Lackawanna,N.Y. B2 ...4
LosAngeles B3 4
Milton,Pa. B6 4
Minnequa,Colo. C10 4
Niles,Calif. P1 4
Pittsburg,Calif. C11 4
Pittsburgh J5 4
SandSprings,Okla. S5 ..4
Seattle B3, N14 4
So.Chicago,Ill. R2 4
So.Duquesne,Pa. U5 5
So.SanFrancisco B3 4
SparrowsPoint,Md. B2..4.65
Sterling,Ill. (1) N15 ....4.60
Struthers,O. Y1 5
Torrance,Calif. C11 ....4.85
Youngstown R2, U5 ....4.60

BARS, Reinforcing (Fabricated; to consumers)
Johnstown, ¼-1" B2 5
KansasCity S5 5
LosAngeles B3 5
Marion,O. P11 5
Seattle B3, N14 5
Sand Springs S5 5
So.SanFrancisco B3 5
SparrowsPt. ½-1" B2..5.75
Williamsport,Pa. S19 ..5.35

RAIL STEEL BARS
ChicagoHts.(3) C2 ....5.20
ChicagoHts.(4) C2 ....5.20
ChicagoHts.(3,4) I-2 ....5.20
Franklin,Pa.(3) F5 ....5.20
Franklin,Pa.(4) F5 ....5.75
FortWorth,Tex.(26) T4..5.15
Marion,O.(3) P11 .....5.20
Moline,Ill.(3) R2 .....5.35
Tonawanda(3,4) B12 ..5.20
Williamsport(3) S19 ..5.35
Williamsport,Pa.(4) S19 5.35

BARS, Wrought Iron
Economy,Pa.(S.R.) B14 7.40
Economy,Pa.(D.R.)B14 7.90
Economy(Staybolt) B14 8.20
Mck.Rks.(Staybolt) L5 7.60
Mck.Rks.(S.R.) L5 ..7.40
Mck.Rks.(D.R.) L5 ..7.90

—SHEETS—

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..2.25
Ashland,Ky.(8) A10 ....2.25
Butler,Pa. A10 .....2.25
Cleveland J5, R2 .....2.25
Conshohocken,Pa. A3 ..2.25
Detroit M1 .....2.30
Ecorse,Mich. G5 .....2.25
Fairfield,Ala. T2 .....2.25
Fairless,Pa U5 .....2.25
Fontana,Calif. K1 ....2.70
Gary,Ind. U5 .....2.25
Geneva,Utah C11 .....2.25
GraniteCity,Ill. G4 ....2.30
Ind.Harbor,Ind. I-2, Y1 2.25
Irvin,Pa. U5 .....2.25
Lackawanna,N.Y. B2..2.25
Munhall,Pa. U5 .....2.25

Niles,O. N12 .....5.425
Pittsburg,Calif. C11 ..4.625
Pittsburgh J5 .....3.925
Riverdale,Ill. A1 .....3.925
Sharon,Pa. S3 .....4.225
So.Chicago,Ill. W14 ...3.925
SparrowsPoint,Md. B2..3.925
Steubenville,O. W10 ..3.925
Torrance,Calif. C11 ..4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ...3.925
Youngstown U5, Y1 ...3.925

SHEETS, H.R. (19 gage)

AlabamaCity,Ala. R2 ..5.225
Dover,O. R1 .....5.825
Mansfield,O. E6 .....5.80
Niles,O. N12 .....5.20
Torrance,Calif. C11 ....5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....5.90
Conshohocken,Pa. A3 ..6.15
Ecorse,Mich. G5 .....6.375
Fairfield,Ala. T2 .....5.90
Fontana,Calif. K1 .....7.00
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ....5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa U5 .....5.90
Lackawanna(35) B2 ...5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So.Chicago,Ill. U5 ....5.90
SparrowsPoint(38) B2 ..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 ....6.175
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind.Harbor,Ind. I-2 ..4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10 .....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 .....4.975
Fairfield,Ala. T2 .....4.775
Fairless,Pa. U5 .....4.875
Follansbee,W.Va. F4 ..5.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....5.275
Ind.Harbor,Ind. I-2, Y1 4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2 ..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ..5.725
Pittsburgh J5 .....4.775
SparrowsPoint,Md. B2..4.775
Steubenville,O. W10 ..4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ....4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 .....7.675
Fontana,Calif. K1 .....8.275
Gary Ind. U5 .....7.225
IndianaHarbor,Ind. Y1 .7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ...7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2.7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.475
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10 .....5.275
Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2 .5.275
Ashland,Ky.(8) A10 ..5.275
Canton,O. R2 .....5.275
Dover,O. R1 .....5.475
Fairfield,Ala. T2 ....5.275
Gary,Ind. U5 .....5.275
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.325
Irvin,Pa. U5 .....5.275
Kokomo,Ind. C16 ....5.375
MartinsFerry,O. W10 ..5.275
Niles,O. N12 .....5.80
Pittsburg,Calif. C11 ...6.025
SparrowsPoint,Md. B2 5.275
Steubenville,O. W10 ..5.275
Torrance,Calif. C11 ...6.025
Weirton,W.Va. W6 ....5.275

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2 .8.075

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10 ..5.525
Canton,O. R2 .....6.025

SHEETS, Culvert

	Cu Alloy	Cu Fe
Ashland,Ky. A1	6.325	....
Canton,O. R2	6.475	6.925
Fairfield(41) T2	6.075	6.325
Gary,Ind. U5	6.075	6.325
Ind.Harbor I-2	6.075	6.325
Irvin.Pa.(41) U5	6.075	6.325
Kokomo,Ind. C16	6.525	....
MartinsFry.,O. W10	6.075	....
Pitts.,Cal.C11(41)	6.825	....
SparrowsPt. B2	6.075	....
Torrance,Calif.C11	6.625	....

SHEETS, Culvert

	Pure Iron
Ashland,Ky. A10	6.575
Fairfield,Ala.(41) T2	6.325
MartinsFerry,O. W10	6.325

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825
Kokomo,Ind(13) C16 ..5.925
Niles,O. N12 .....6.35

SHEETS ZINCGRIP STEEL

Butler,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electro Galvanized

Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ...5.875
Ind.Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.

Yorkville,O. W10 .....7.20
Follansbee,W.Va. F4 ...7.30
Follansbee (23) F4 ..7.175

SHEETS, Long Terne Steel (Commercial Quality)

BeechBot'tm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....6.25
Middletown,O. A10 ....5.675
Niles,O. N12 .....6.00
Weirton,W.Va. W6 ....5.675

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.075

SHEETS, Well Casing

Fontana,Calif. K1 .....6.20

—STRIP—

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(28) R2 ..3.925
Alton,Ill. L1 .....4.20
Ashland,Ky.(8) A10 ..3.925
Atlanta A11 .....4.475
Bessemer,Ala. T2 ....3.925
Bridgeport,Con.(10)S15 4.425
Buffalo (27) R2 .....3.925
Butler,Pa. A10 .....3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 .4.325
Detroit M1 .....4.40
Ecorse,Mich. G5 .....4.225
Fairfield,Ala. T2 ....3.925
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.425
Ind.Harbor,Ind. I-2 ...3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5..4.625
Lackw'na,N.Y.(32) B2.3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. B6 .....4.36
Minnequa,Colo. C10 ...5.025
NewBritain(10) S15 ...4.425
N.Tonawanda,N.Y. B11.3.925
Pittsburg,Calif. C11 ...4.675
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....4.225
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25) B3.4.675
SparrowsPoint,Md. B2 .3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....4.025
Youngstown Y1, U5 ...3.925

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.45
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.90
KansasCity,Mo. S5 .....7.10
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.45
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....5.65
Conshohocken,Pa. A3 ...6.20
Ecorse,Mich. G5 .....6.50
Fairfield,Ala. T2 .....5.65
Fontana,Calif. K1 ....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ...6.00
LosAngeles(25) B3 ....6.40
Seattle(25) B3 .....6.65
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25)B3 .6.40
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6.....6.30
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(2) A10 ...4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6 ..5.80
Bridgeprt,Conn.(10) S15.6.15
Bulter,Pa. A10 .....5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....6.05
Detroit D2 .....5.95
Detroit M1 .....5.45
Dover,O.(40) G6 .....5.80
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ...5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill.(40 T6.5.70
Ind.Harbor,Ind. I-2 ...5.70
Lackawanna,N.Y. B2 ...5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 ....5.45
NewBritain(10) S15 ....6.15
NewCastle,Pa.(14) B4 ..5.45
NewCastle,Pa. E5 .....5.95
NewHaven,Conn. A7 ...5.95
NewHaven,Conn. D2 ...6.20
Pawtucket,R.I. R3 .....6.80
Pawtucket,R.I.(21) N8..6.65
Riverdale,Ill. (40) A1 ..5.70
Rome,N.Y.(29) R6 .....5.45
Sharon,Pa. S3 .....5.80
SparrowsPoint,Md. B2 ..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2(50) .6.40
Warren,O.(40) T5 .....5.95
Warren,O. R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. W19....7.05
Youngstown C8 .....5.95
Youngstown Y1 .....5.45

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15 12.15
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 ....12.00
NewBritn,Conn.(10)S15 12.15
Pawtucket,R.I.(11) N8.12.15
Pawtucket,R.I.(12) N8.12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ..12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.50
Lackawanna,N.Y. B2 ..8.15
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. 8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 .....8.30
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....6.05

STRIP, Electro Galvanized

Dover,O. G6 .....5.70
Warren,O. T5 .....5.70
Weirton,W.Va. W6 .....5.45
Youngstown C8 .....5.95

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.55
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur D. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lake Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H7 Helical Tube Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div.,Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel Co
Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	8.00	8.60	10.55	12.85
Bridgeport,Conn.(10) S15	6.15	8.00	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	....
Carnegie,Pa. S18	...	8.00	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	6.05	8.25	8.85	....	....
Detroit D2	6.45	7.85	8.45	10.55	....
Dover,O. G6	6.05	8.00	8.60	10.55	12.85
FranklinPark,Ill. T6	5.80	7.80	8.75	10.70	....
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Mattapan,Mass. T6	6.30	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15	6.15	8.00	8.60	10.55	12.85
NewCastle,Pa. B4	5.80	8.00	8.60	....	....
NewCastle,Pa. E5	5.95	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	6.70	7.95	8.55	10.50	....
NewYork W3	...	8.30	8.90	10.85	13.15
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	...	8.00	8.60	10.55	12.85
Worcester,Mass.,Base	6.65	7.95	8.90	10.85	13.15
Sharon,Pa. S3	...	8.00	8.60	10.55	12.85
Trenton,N.J. R5	...	8.30	8.90	10.85	13.15
Wallingford,Conn. W2	6.65	7.95	8.90	10.85	13.15
Warren,O. T5	6.20	8.00	8.60	10.55	12.85
Weirton,W.Va. W6	5.80	8.00	8.60	10.55	12.85
Worcester,Mass. A7	5.75	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.30	7.95	8.90	10.85	13.15
Youngstown C8	...	8.00	8.60	10.55	12.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.50	15.00	....
FranklinPark,Ill. T6	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Harrison,N.J. C18	...	...	12.50	15.00	18.00
New York W3	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Youngstown C8	...	...	10.30	12.50	15.35

SILICON STEEL

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut lengths ½c lower)	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	8.35	9.60	10.40
Brackenridge,Pa. A4	...	...	8.85	10.10	10.90
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	8.05	8.35	8.85	(34)	...
Mansfield,O. E6 (cut lengths)	7.55	7.85	8.35	9.60	10.40
Newport,Ky. N9 (cut lengths)	...	7.85	8.35	9.60	10.40
Niles,O. N12 (cut lengths)	7.55	8.85	8.35	...	...
Vandergrift,Pa. U5	...	8.35	8.85	10.10	10.90
Warren,O. R2	8.05	8.35	8.85	10.10	10.90
Zanesville,O. A10	...	8.35	8.85	10.10	10.90

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower)	Transformer Grade 72	65	58	52
BeechBottom W10 (cut lengths)	10.95	11.50	12.20	13.00
Brackenridge,Pa. A4	11.45	....	....	....
Newport,Ky. N9 (cut lengths)	10.95	....	....	....
Vandergrift,Pa. U5	11.45	12.00	12.70	13.50
Warren,O. R2	11.45	....	....	....
Zanesville,O. A10	11.45	12.00	12.70	13.50
H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	**T-100**	**T-90**	**T-80**	**T-73**
Butler,Pa. A10 (C.R.)	....	....	16.05	16.55
Vandergrift,Pa. U5	14.00	14.85	15.85	16.35

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	...	...
Pittsburg,Calif. C11	8.15	8.40	8.90
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yourkville,O. W10	7.40	7.65	8.05

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	...
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2,Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburgh,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.55

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Atlanta A11	5.775
Alton,Ill. L1	5.75
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (24) S1	6.02
Houston S5	5.925
Johnstown,Pa. B2	5.625
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.725
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill. (1) N15	5.525
Struthers,O. Y1	5.525
Torrance,Calif. C11	6.475
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.15
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	*6.925*
Johnstown,Pa. B2	6.925
Milbury (12) N6	8.725
Minnequa,Colo. C10	7.175
Monessen,Pa. P7	6.925
Monessen,Pa. P16	6.95
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Roebling,N.J. R5	7.225
Portsmouth,O. P12	6.925
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.85
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.875
Monessen,Pa. P7	6.625
Monessen,Pa. P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Torrance,Calif. C11	7.575
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving (8"Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland (42) A7	10.55
Crawf'sville,Ind. M8	10.55
Fostoria,O. S1 (43)	*6.925*
Johnstown,Pa. B2 (43)	8.90
Kokomo,Ind. C16	10.55
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill.(42) A7	10.55
Worcester,Mass.(42) A7	10.85
Worcester,Mass. T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Johnstown,Pa. B2	9.50
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE	(A)
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P16	9.35
Monessen,Pa. P7	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.35
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.00
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawf'sville,Ind.M8(4)	7.55
Dover,O. G6	7.45
Fostoria,O. S1 (43)	6.00
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P16	7.45
Monessen,Pa. P7	7.45
Pawtkt.R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld. Galv.
AlabamaCity R2	6.675 7.075
Aliquippa J5	*6.675-7.20**
Atlanta A11	6.925 7.475
Bartonville(19)K4	6.675 7.225
Buffalo W12	6.675 7.075
Cleveland A7	6.675 ....
CrawfordsvilleM8	6.775 7.325
Donora,Pa. A7	6.675 7.075
Duluth,Minn. A7	6.675 7.075
Fairfield T2	6.675 7.075
Houston,Tex. S5	7.075 7.475
Johnstown B2(48)	6.675 7.225
Joliet,Ill A7	6.675 7.075
KansasCity,Mo.S5	7.275 7.675
Kokomo C16	6.775 7.175
LosAngeles B3	7.625 ....
Minnequa C10	6.925 7.325**
Monessen P7(48)	6.675 7.225
Palmer W12	6.975 7.375
Pitts.,Calif. C11	7.625 8.025
Prtsmth.(18)P12	6.575 ....
Rankin A7	6.675 7.075
So.Chicago R2	6.075 6.325
So.S.Frn. C10	7.625 8.025**
Spar'wsPt. B2(48)	6.775 7.325
Sterl'g(1)(48)N15	6.675 7.225
Struthers,O. Y1	6.675 7.175
Worcester A7	6.975 ....

*Based on 10c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)	An'ld. Galv. Stone
Aliquippa J5	*10.63-12.72**
Bartonville(19)K4	10.73 12.51
Cleveland A7	12.50 ....
CrawfordsvilleMS	12.50 14.35
Fostoria,O. S1	12.60 14.15
Johnstown B2	12.50 14.35
Kokomo C16	12.60† 14.15‡
Min'qua C10	12.75 14.45**
Palmer,Mass.W12	12.50 14.05
Pitts.,Calif. C11	12.85 14.40
SparrowsPt. B2	12.60 14.45
Sterling(1) N15	10.73 12.15
Waukegan A7	12.50 14.05
Worcester A7	12.80 ....

*Based on 11c zinc; **Subject to zinc equalization extras.

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	153
Aliquippa,Pa. J5	*150*
Atlanta A11	159
Bartonville,Ind.(19) K4	156
Crawfordsville,Ind. M8	159
Donora,Pa. A7	153
Duluth,Minn A7	153
Fairfield,Ala. T2	153
Houston,Tex. S5	161
Johnstown,Pa. B2	156
Joliet,Ill. A7	153
KansasCity,Mo. S5	165
Kokomo,Ind. C16	155
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173
Rankin,Pa. A7	153
So.Chicago,Ill. R2	153
S.San.Francisco C10	173**
SparrowsPoint,Md. B2	158
Sterling,Ill.(1) N15	156

*On 11c zinc; **Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga.	Col.
AlabamaCity,Ala. R2	140
Ala.City,Ala.17 ga. R2	235
Ala.City,Ala.18 ga. R2	245
Aliqp'pa,Pa.9-14½ga.J5	*143**
Atlanta A11	146
Bartonville,Ill.(19) K4	143
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140
Duluth,Minn. A7	140
Fairfield,Ala. T2	140
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17ga.,6" B2	234
Johnstown, 4"	237
Joliet,Ill. A7	140
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163
Rankin,Pa. A7	140
So.Chicago,Ill. R2	140
Sterling,Ill. (1) N15	143

*On 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	152
Bartonville,Ill.(19) K4	149
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

NAILS, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	*131*
Atlanta A11	134
Bartonville,Ill. (19) K4	131
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet, Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif C11	150
Portsmouth,O. P12	132
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, Cut (100 lb keg) to dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	*133*
Atlanta A11	136
Bartonville,Ill. (19) K4	133
Bartonville,Ill. (19) K4	133
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Portsmouth,O. P12	132
Rankin,Pa. A7	133
So.Chicago,Ill. R2	131
SparrowsPt.Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

—FENCE POSTS—

	Col.
ChicagoHts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	143
Franklin,Pa. F5	145
Johnstown,Pa. B2	148
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	18.25	...	22.25	...	24.75	...	26.25	...	26.25	...	26.00	...	28.50	...
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.50	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.50	22.25	5.00	23.75	6.50	23.75	6.50	23.00	5.75	25.50	8.25

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown R2 (††)	15.75	list	19.75	2.5	22.25	5.0	23.75	6.5	23.75	6.5	23.0	5.75	25.5	8.25

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft.	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft.	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv.	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv.
Aliquippa, Pa. J5 (††)	....	....	....	....	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 (§)	....	....	....	....	....	....	23.25	7	26.25	11	28.75	14.5	31.25	15.5	31.75	16.5
Benwood, W.Va. W10(††)	25.5	+0.75	17.75	+6	10.25	+10.75	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Butler, Pa. F6 (†)	26.5	+2.75	19.5	+7.25	12.5	+13	....	....	....	....	....	....	....	....	....	....
Etna, Pa. N2 (†)	28	+1.25	22	+4.75	16	+9.5	28.75	9.5	31.75	13.5	34.25	17	36.75	18.75	37.25	19.75
Fontana, Calif. K1 (††)	....	....	....	....	....	....	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	....	....	....	....	....	....	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	....	....	....	....	....	....	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (†)	28	+1.75	22	+1.75	16	+5	....	....	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Sparrows Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (††)	....	....	....	....	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Youngstown Y1 (††)	....	....	....	....	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.50	34.25	18.50	34.75	19.50

Size—Inches	2		2½		3		3½		4	
List Per Ft.	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft.	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (†)	35.25	20	36.75	20	36.75	20	....	....	....	....
Alton, Ill. L1 (§)	32.25	17	33.75	17	33.75	17	....	....	....	....
Benwood, W.Va. W10(††)	35.25	20	36.75	20	36.75	20	27.75	10.5	27.75	10.5
Etna, Pa. N2 (†)	37.75	20.25	39.25	21	39.25	21	30.25	11.5	30.25	11.5
Fontana, Calif. K1 (††)	22.25	7	23.75	7	23.75	7	....	....	....	....
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
Sharon, Pa. M6	35.25	20	36.75	20	36.75	20	....	....	....	....
Sparrows Pt., Md. B2 (§)	33.75	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (††)	35.25	20	36.75	20	36.75	20	27.75	10.5	27.75	10.5
Youngstown Y1 (††)	35.25	20.00	36.75	20.00	36.75	20.00	....	....	....	....
Wheatland, Pa. W9 (§)	35.25	20	36.75	20	36.75	20	....	....	....	....

Galvanized pipe discounts based on zinc price of: (†), 14c (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 11.00c; (††), 10.59c-11.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft., inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.31	18.44
1¼	13	....	25.24	18.12
1½	13	23.12	27.89	20.01
1¾	13	26.84	32.37	23.66
2	13	30.08	36.28	26.51
2¼	13	34.18	41.23	29.86
2¾	12	37.10	44.75	32.41
2½	12	40.51	48.86	35.70
2¾	12	43.85	52.90	38.66
3	12	45.92	55.39	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. Tee Rails All No. 2	60 lb Under
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	....	5.20
Fairfield,Ala. T2	....	....	....	5.20
Gary,Ind. U5	4.325	4.225	4.275	...
Huntington,W.Va. W7	....	....	....	5.20
IndianaHarbor,Ind. I-2	4.325	4.225	4.275	...
Johnstown,Pa. B2	....	....	...(16)	5.20
Lackawanna,N.Y. B2	4.325	4.225	....	5.20
Minnequa,Colo. C10	4.325	4.125	....	5.70
Steelton,Pa. B2	4.325	4.225	....	...
Williamsport,Pa. S19	....	....	....	5.20

TIE PLATES

Fairfield,Ala. T2	5.125
Gary,Ind. U5	5.125
Ind.Harbor,Ind. I-2	5.125
Lackawanna,N.Y. B2	5.125
Minnequa,Colo. C10	5.125
Pittsburg,Calif. C11	5.275
Seattle B3	5.275
Steelton,Pa. B2	5.125
Torrance,Calif. C11	5.275

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	11.00
Lebanon,Pa. (31) B2	10.75
Minnequa,Colo. C10	11.00
Pittsburgh P14	11.00
Pittsburgh O3	11.00

AXLES

Ind.Harbor,Ind. S13	6.50
Johnstown,Pa. B2	6.50
Youngstown R2	7.05

JOINT BARS

Bessemer,Pa. U5	5.275
Fairfield,Ala. T2	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Joliet,Ill. U5	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Steelton,Pa. B2	5.275

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	7.05
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.05
Minnequa,Colo. C10	7.05
Pittsburgh J5	*7.05*
Seattle B3	7.55
So.Chicago,Ill. R2	7.05
Struthers,O. Y1	7.05

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

	Light
6 in. and shorter:	
½-in. & smaller diam.	4
⅝-in. & ⅝-in.	5
¾-in. and larger	3
Longer than 6 in.:	
All diams.	+4
Lag bolts, all diams.:	
6 in. and shorter	12
over 6 in. long	8
Ribbed Necked Carriage	5
Blank	25
Plow	25
Step, Elevator, Tap and Sleigh Shoe	12
Tire Bolts	List
Boiler & Fitting-Up Bolts	23

NUTS

H.P. & C.P.	Reg.	Hvy.
Square:		
½-in. & smaller	+2	2
⅝-in. & ⅝-in.	+7	+32
¾-in.-1½-in.	+8	+27
1⅝-in. & larger	+9	+27
H.P. Hex.:		
½-in. & smaller	11	8
⅝-in. & ⅝-in.	2	+20
¾-in.-1½-in.	+6	+25
1⅝-in. & larger	+8	+25
C.P. Hex.:		
½-in. & small.	11	8
⅝-in. & ⅝-in.	9	+2
¾-in. & 1½-in.	+1	+9
1⅝-in. & larger	+16	+20

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller.	23	14
⅝-in. & ⅝-in.	18	4
¾-in.-1½-in.	8	+8
1⅝-in. & larger.	+14	+20

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼-in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5 & 10
Plated finishes	30 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	38
¾-in. through 1 in.	22
Longer than 6 in.:	
⅝-in. and smaller	20
¾-in. through 1 in.	7

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
	CARBON	
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+ % Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. N.Y., c.l., in bags	*11.25*
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99+ % Fe)	36.50
Unannealed (99+ % Fe) (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	34.00
Antimony, 500 lb lots	78.00
Brass, 20-ton lots	*29.50-36.50*
Bronze, 10-ton lots	*51.00-60.00*
Copper:	
Electrolytic	*43.25*
Reduced	*43.25*
Lead	21.75
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	*47.00*
Silicon	38.50
Tin	*14.00**
Solder	8.50*
Stainless Steel, 302	*91.00*
Zinc, 10-ton lots	17.50-25.00

Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.35
Less than 1000 lb	5.50
Chromium, electrolytic 99.9% Cr min.	3.50

* plus cost of metal.

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh; f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in.,larger 8.90c
⅞-in. under 26.5 off

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.58c; 1 15/16" to 7 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(15) ½" and thinner.
(16) 40 lb and under
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.05c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Add $31.50 per ton.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Plus 0.375c per 100 lb.
(43) Plus 4.7% on base and extras.
(48) 6-7 gage.
(49) U-post; add 2 cols. for T-post.
(50) 0.025 gage; 6.55c for 0.026 to 0.068 gage; 6.65c for 0.069 gage and over.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301 ..	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B ...	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S ...	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	...	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F ...	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
446	...	....	33.75	38.25	53.00	39.50	40.75	59.75	71.00
501	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Division, U. S. Steel Corp.; Armco Steel Corp.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur D. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Co.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Division, Borg Warner Corp.; Jessop Steel Co.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; Page Steel & Wire Division, American Chain & Cable Co. Inc.; Republic Steel Corp.; Rome Mfg. Co.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Stainless Welded Products Inc.; Superior Steel Corp.; Timken Roller Bearing Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 10%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
Stainless 302	....	....	19.75†	31.00	77.00
304	27.60	32.70	24.50†	32.50	77.00
309	30.50†	35.00†	....	....	....
310	36.50†	41.00†	....	....	144.00
316	32.60	37.70	26.00†	42.75	....
317	34.50†	39.00†	....	....	....
318	33.50†	38.00†	....	....	....
321	29.30	34.40	23.00†	37.00	111.00
347	27.50†	32.00†	24.00†	40.50	130.00
405	23.40	30.60	....	....	....
410	22.90	30.10	....	....	....
Nickel ..	33.55†	45.15†	....	....	....
Inconel ..	41.23†	54.18†	....	....	165.00
Monel ..	34.93†	46.28†	....	....	....
Copper* ..	....	....	....	44.00†	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Nickel	41.00†	54.00†	....	....
Copper*	27.85	35.85	24.00	32.2.

* Deoxidized. Production points: Stainless, sheets, N Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C Coatesville, Pa. L7 and Washington, Pa. J3; nickel, conel, monel-clad plates, Coatesville L7; copper-clad str Carnegie, Pa. S18. Production point for copper-b sheets is Carnegie, Pa. A13.

† Add 4.7% on base and extras.

TOOL STEEL

Grade	$ per lb	Grade	$ per
Regular Carbon .	0.25-.285	5% Cr Hot Work	0
Extra Carbon ..	0.33-.340	W-Cr Hot Work	0
Special Carbon ..	0.35-.360	V-Cr Hot Work	0
Oil Hardening ...	0.370-.39	Hi-Carbon-Cr. ..	0.665-

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per
20.25	4.25	1.6	12.25	...	4.
18.25	4.25	1	4.75	...	2.
18	4	2	9	...	2.565-2.
18	4	2	...	...	1.
18	4	1	...	...	1.580-1.
13.5	4	3	...	...	1.
6.4	4.5	1.9	...	5	1.
6	4	3	...	6	1.
2	1.4	1.2	...	...	0.
1.5	4	1	...	8.5	0.

Tool steel producers include: A4, A8, B2 B8, C4, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Automotive Steel Percentage Higher

Motor car builders take 19.7 per cent of total steel shipped in first 5 months this year against 15.2 per cent in 1952. Supplant warehouses as leading outlet

New York—The tremendous influence of automotive demand in the steel market never was more noticeable than currently.

Steel production at near-capacity level is getting a substantial part of its support from the automotive industry. In fact, auto steel needs bulk so large in the current movement any letdown in consumption in that area is seen as quickly eliminating current tight supply conditions.

In the first five months of this year, data collected by the American Iron & Steel Institute show that the automotive industry held first place as a steel consumer.

Shipments to the industry in that period totaled 6,747,445 net tons, equal to 19.7 per cent of total shipments to all consuming industries of 35,429,320 net tons. In the like period of 1952 the automotive take amounted to only 15.2 per cent of total shipments of 31,718,441 net tons.

As the Steel Institute's data show, the automotive industry over the past year has replaced the warehouses as the leading outlet for steel. In the first five months of last year the warehouses accounted for 20.6 per cent of total steel shipments. In the first five months this year, however, their take amounted to 19.2 per cent.

Thus, it is seen that while the percentage take of the warehouses is off 1.4 per cent this year, that of the automotive industry has risen 4.5 per cent.

Other lines of consumption which show percentage gains over a year ago include: Converting and processing; appliances, utensils and cutlery; other domestic and commercial equipment; ordnance and military items.

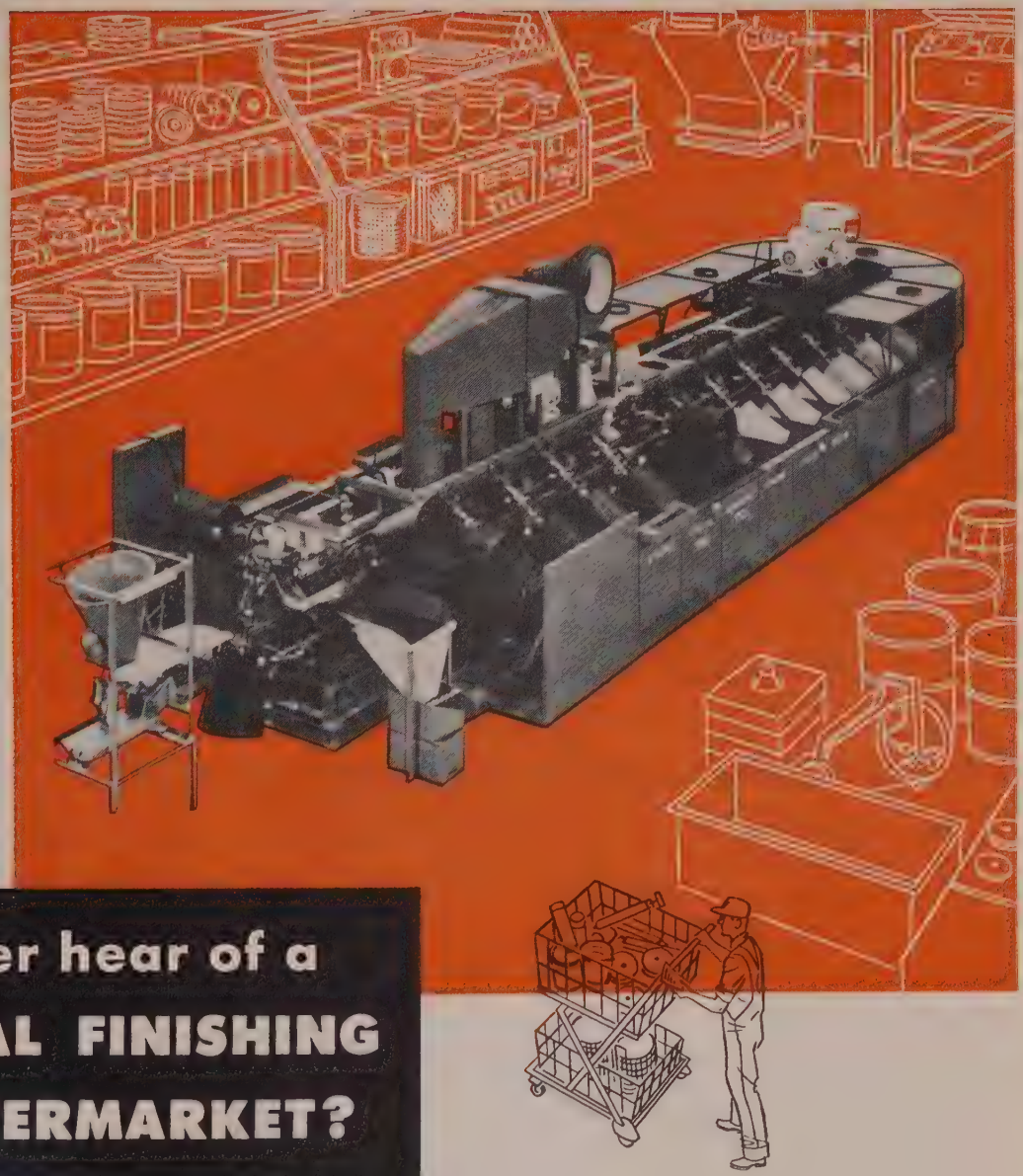
On the other hand percentage declines are reported for: Industrial fasteners; construction, including maintenance; contractors' products; railroads; shipbuilding; oil and gas drilling; mining, quarrying and lumbering; agricultural machinery; machinery, industrial equipment and tools; containers.

Despite these percentage declines however, nearly all of these latter consuming industries actually received larger tonnage in the first five months this year than in 1952 in the like period because of larger production

STEEL SHIPMENTS BY MARKET CLASSIFICATIONS

(All grades, Carbon, Alloy, Stainless)
(Net Tons)

Market Classification	May 1953 Shipments	5 Months 1953 Shipments
Converting & Processing .	372,497	1,802,1
Forgings	141,065	732,6
Bolts, Nuts, etc.	135,411	645,1
Warehouses	1,296,236	6,558,0
Construction	789,535	3,982,0
Contractors' Products	276,108	1,314,3
Automotive	1,446,232	6,747,4
Railroads	417,880	2,035,3
Shipbuilding	74,098	430,9
Aircraft	12,771	71,8
Oil & Gas Drilling	59,924	357,2
Mining, Quarrying, Lumbering	26,187	143,4
Agricultural	105,630	600,6
Machinery & Equipment .	389,556	1,927,8
Electrical Machinery	185,013	902,8
Appliances, etc.	189,099	925,2
Other Domestic & Commercial Equipment	181,953	879,6
Containers	575,118	2,681,9
Ordnance, etc.	231,152	1,088,8
Shipments of non-reporting firms	75,023	396,6
Exports	228,908	1,205,9
Total Shipments	7,209,396	35,429,3



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WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	6.20	7.64	7.81	7.00	...	6.86	8.17[6]	12.04	6.98	6.85	7.98
Boston	6.89	7.83	9.23	7.13	...	6.87	8.10	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	9.01	6.79	...	6.35	7.45	12.17	6.59	6.68	7.88
Birmingham	6.10	7.00	8.00[2]	6.30	...	6.15	8.90	....	6.35	6.35	8.65
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	8.05	6.42	...	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	8.47	6.72	...	6.58	7.66	12.17	6.93	6.85	7.88
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.40	11.89	6.79	6.50	7.79
Detroit	6.45	7.32	8.34	6.71	...	6.57	7.60	11.92	6.93	6.85	7.80
Houston	6.89	...	8.62	7.16	...	7.13	...	....	6.94	6.86	8.24
JerseyCity,N.J.	6.54	7.45	8.72	6.82	...	6.75	8.43[6]	11.84	6.50	6.67	8.01
Los Angeles	7.25	9.00	9.60	7.55	11.20	7.15	9.75	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.22	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.31	7.17	8.25	6.45	...	6.33	7.37	....	6.42	6.38	...
New York	6.54	7.45	8.72	6.82	...	6.75	8.43[6]	11.84	6.50	6.67	8.01
Newark, N. J.	6.78	7.75	9.02	7.16	...	7.06	8.43[6]	....	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.20	...	7.20	8.50	....	7.20	7.15	7.85
Philadelphia	6.53	7.55	8.35	7.02	8.80	6.87	8.19[6]	11.89	6.67	6.63	7.65
Pittsburgh	6.18	7.12	8.60	6.55	...	6.28	7.40	11.75	6.46	6.33	7.46**
Portland, Oreg.	7.80	9.05	9.30	7.50	...	7.25	9.40	....	7.25	7.05	9.25
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	....	7.10	6.85	8.10
St. Louis	6.48	7.42	8.35	6.72	...	6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.47	7.48	8.56	6.77	...	6.64	7.78	....	6.73	6.69	7.92
San Francisco	7.35	8.70	10.15	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle (city)	8.15	8.70	10.10	8.02	...	7.58	10.13	13.50	7.50	7.59	9.40
Spokane (city)	8.45	9.25	9.80	8.40	...	7.95	10.55	13.20	7.45	7.45	9.80
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed; ** ⅛" and heavier, 8.09c for No. 12 and lighter. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; Cold-finished bars, 2000 lb and over; [2]—500 to 9999 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over.

Warehouse Stocks Remain Unbalanced

Seasonal factors cause decline of around 10 per cent in July. Distributors estimate over-all supplies at 60 to 65 per cent of normal with sheets, plates, bars tight

Chicago—Warehouse stocks, over-all, are estimated at 60 to 65 per cent of normal currently, but several products continue in short inventory and without signs of early alleviation. Still short are sheets in all categories, structurals, and hot-rolled and cold-finished bars in the larger sizes. On the other hand, demand for steel lacks recent frantic tone. There has been some easing too stemming from vacation closings of manufacturing plants but this is regarded as nearing an end.

Cleveland — Vacation curtailments at manufacturing plants served to reduce order volume of district warehouses during July and expectations are August business will be similarly affected, although in lesser degree.

Volume, on the whole, has held up considerably well so far this summer and the warehouses have not been able to achieve anything like balanced inventories. Over-all stocks have shown steady improvement in recent months, but in some items, such as hot and cold-rolled sheets, large-size bars, structurals and heavy plates, demand has been so well sustained the distributors have not had much chance to replenish stocks with material moving out almost as quickly as it is received from the mills.

Cincinnati—Business is satisfactory with most warehouses in this area. Demand is off, partly due to vacation shutdowns. Delivery from mills has improved.

The supply of sheets, tubing and structurals remains tight. The October quota for structurals remains unchanged. Alloy bars and stainless steel are in fairly good supply.

Warehousemen are looking for inventory improvement in third quarter. The Korean truce is expected to have little effect on warehouse business.

Pittsburgh—Warehousemen expect the current summer doldrums in this district to disappear before long. Shutdowns due to vacations are still affecting activity here. In particularly strong demand are sheets and lighter thicknesses of plates. Orders for structural shapes and carbon bars over 2 in. in thickness are also heavy.

Philadelphia—Warehouse operators report wide flange beams are in the most critical supply of all products in inventory. Consumers are seeking tonnage as fast as distributors receive it from the mills.

Cold-rolled sheets and popular sizes of bars rank next in shortage. However, on an over-all basis, July business was off reflecting the vacation season. Some distributors estimated their volume was down about 10 per cent, but less dollar-wise because of higher prices.

Boston — Distributors' inventories are getting into balance product by product. Warehouses are more selective in placing fourth quarter tonnage. With deliveries improved, some distributors are holding back on placement of late fourth quarter orders and are turning back bonus tonnage offered.

Cold-rolled sheet and structural stocks are building up slowly, but supplies of flat-rolled specialties are in balance.

Los Angeles—Even without preferential treatment they enjoyed under M-6, and having the same place at the table as any fabricator, distributors are getting just about the same amount of tonnage as previously. Demand is generally softer.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 169

Chicago—Foundry coke supply is more than accommodating demand and there has been some slowing down in output. Because fuel has been easily available for some time foundries haven't been disposed to take offerings as freely as has been the case with pig iron. During July and August, vacation shutdowns of foundries restricted coke consumption.

Nail Imports Restrict Domestic Sales

Foreign tonnage coming in at prices about $1 per ton under domestic quotations. Production of American mills reported running under 60 per cent of capacity

Nail Prices, Page 150

New York—Foreign nails, arriving in this country at prices about $1 per ton under the domestic market, are tending to restrict the business of American nail makers who have been finding demand sluggish at best.

Production of American nails is running under 60 per cent of capacity, some trade sources report.

Trend of nail imports is upward compared with a year ago. Last year imports of wire nails and staples amounted to 17,522 net tons. Foreign arrivals during the first four months of this year totaled 8160 net tons, or at the rate of 24,480 tons for the year. A leading nail interest here believes that imports since the end of April at least have been sustained, if not increased.

The uptrend in imports does not mean necessarily that 1953 volume will be anywhere near the quantity received in some recent years. In 1951, imports of wire nails and staples amounted to 54,196 net tons and in 1950, 65,807 tons, believed to be an all-time high. Nor will imports this year likely amount to more than a fairly small percentage of domestic nail production.

Estimates of nail output for this year are not available, but in 1952 production of wire nails and staples amounted to 677,778 net tons. In 1951, production totaled 863,265 tons and in the year before, 901,081 tons, a post-war peak if not an all-time record. So, percentage-wise, imports are not too heavy, but nevertheless important when demand is not sufficient to keep domestic facilities for producing nails fully engaged. And, of course, the particular impact of such importations is felt along the seaboard areas.

Domestic prices here on 8-penny nails are around $8 per keg, f.o.b. New York. Imported nails cost approximately $7 a keg, c.i.f., duty paid. Unloading charges at the piers are said to average around six cents per 100-lb. keg.

Most of the foreign nails now coming in are said to be of good quality. In fact, no small amount is being produced on modern American machines which have been purchased abroad with foreign-aid money.

Most imported nails are now coming in from France, Germany, Belgium and Austria. Some arrivals have also been noted recently from Sweden. Very little at this time is coming in from Japan. Most foreign delivery promises range from a month to six weeks.

Cleveland — Manufacturers wire products are continuing in strong demand but the merchant products are moving comparatively sluggishly, as has been the case for some time past. The slowness in the merchant trade is explained as partially due to seasonal factors.

Fourth quarter orders for manufacturers wire items, such as heading wire, bolt wire and spring wire, are reported being received in satisfactory volume and high-level production well into the last three months of the year is said to be assured.

District plants of the American Steel & Wire Division, U. S. Steel Corp., resumed operations July 27 after a shutdown since July 11 for mass vacations. It is understood some tonnage was shipped from these plants during the vacation period.

Boston—Fourth quarter wire orders are coming through slowly. There is a scattering of late third quarter volume cancellations with openings reported in September schedules on some carbon grades.

Where cancellations have developed, efforts to balance production schedules and inventories is the reason given. Also, where other orders have been dropped, the loss is partially balanced by placement of new volume to meet consumer product changes. Cold-heading wire tonnage is involved in this latter adjustment; also some automotive volume.

Structural Shapes . . .

Structural Shape Prices, Page 148

New York—While there is a slight lull, regarded as more or less seasonal, leading fabricators see plenty of work ahead. One large interest estimates the larger projects likely to come up within a 100 mile radius of this city within the next six months will amount to more than 200,000 tons.

Of this total, possibly 75,000 tons will represent bridge work, 75,000 tons viaduct construction, and more than 50,000 tons commercial work. Included in the latter will be 20,000 to 25,000 tons for the 42-story Socony-Vacuum office building to be erected in the block bounded by Lexington and Third avenues, 41st and 42nd streets, this city. Plans for this structure are expected out early this fall.

While the larger fabricators, particularly those who can engage in bridge work, are booked well ahead,

Berkeley Fabricates Gates for Nimbus Dam

These 42-ton gates are being fabricated by Berkeley Steel Construction Co. Inc., Berkeley, Calif., and will be knocked down after assembly, for shipment to jobsite. Berkeley is fabricating 18 gates, 40 ft wide by 24 ft high, for Bureau of Reclamation to be installed at Nimbus Dam near Fair Oaks, Calif.

seven and eight months in some cases. a number of the smaller fabricators are having difficulty maintaining substantial backlogs, with the result competition among them is stiff.

New York — Structural contracts in June amounted to 232,441 tons, a decline from the revised total for May of 310,517 tons, according to the American Institute of Steel Construction.

Allowing for a revision also in the April total to 306,052 tons, total contracts for the first half of this year amounted to 1,555,318 tons against 1,256,822 in the corresponding period of 1952.

June shipments amounted to 274,587 tons, and compared with revised figures for May of 263,806 and for April of 263,211 tons. Total shipments during the first half of the year were 1,560,470 tons, comparing with 1,360,563 in the first six months of 1952.

Order backlogs at the end of June amounted to 2,152,764 tons, comparing with 2,261,503 a year ago.

Boston—Wide flanged beams excepted, structural fabricating shops will get more plain material in fourth quarter. They are experiencing less difficulty placing requirements with the mills approaching normal deliveries on standard shapes.

Fair volume of foreign steel, angles, channels and lighter stock, is moving.

District shops are again in operation, having lost four weeks by strikes during that period most continued to book contracts and backlogs are somewhat heavier.

Philadelphia — Active activity in wide flange shapes prevails. Independent fabricators can't obtain the material they need from the mills, and here, and in some other eastern districts, are taking tonnage from warehouses just about as fast as the latter are able to get it in.

Bridge work still dominates the market but there is some improvement in school work and hospitals.

Sheets, Strip . . .

Sheet and Strip Prices, Page 141 & 142

Cleveland — Except for increasing reluctance on the part of buyers to order conversion and premium-priced tonnage for fourth quarter, the situation in the sheet and strip market is virtually unchanged from that prevailing over recent months.

The mills are booked full for third quarter and are taking fourth quarter tonnage at a rate that indicates full production schedules through remainder of the year.

While vacations and other seasonal influences have served to curtail consumption slightly in recent weeks there has been no noticeable slowing down in the movement of sheets from the mills. This, it is said, reflects tight supply conditions with consumers anxious to get in supplies in the hope of building inventory.

So far cancellations have figured only to minor extent in current market activity and in all instances the mills have had no difficulty in disposing of canceled tonnage.

Republic Steel Corp. last week issued a revised list of extras covering its sheets, including stainless and electro zinc-coated sheets. The new list became effective July 26 and superseded the card in effect since May 27 this year.

Only two minor changes are involved, the applying to federal specifications now reads. Where Republic electro zinc-coated or metal-coated sheets in gages 25 and lighter are required to meet latest issue of federal specifications QQ-I-716 dated Mar 19 1942, Class D-2 or E-2, the extra for coating over price base is $1 per 100 pounds.

The second change applying to zinc coating now reads. Where Republic electro zinc-coated and electro metal-coated sheets in gages 24 and heavier are required to meet coating requirements of latest issue of federal specifications QQ-I-716 dated Mar 19, 1942, Class D-2 or E-2, or equal, the extra for coating over price base is 25 cents per 100 pounds.

Boston — Hot-rolled sheet shipments from the Fairless Works will reach New England consumers in volume this month. Limited range of sizes restricts demand, but wider sheets in more gages are being rolled ahead of schedule.

Certain sheet consumers experience less difficulty in placing fourth quarter requirements. Numerous users are more conservative in buying, and are withholding orders for last fourth quarter. Suppliers to the automotive industry are somewhat hesitant, being cautioned as to what will be needed for November-December.

Stainless orders are heavy, notably 430 straight chromium grades. One stamping shop producing auto parts is operating 50 per cent on stainless.

New York—Sheet supply especially for black sheets continues well in excess of supply. There is not the slightest indication of relief in the tonnage movement, sheets in particular but pressure on domestic users for regularly priced material is heavy.

Tonnage is beginning to move from the Fairless, Pa., works but volume will be limited for a while by width and gages. The width, 88 inches, is all right for most requirements of cold sheets, but there is an effort at the works at present to restrict the gages to no lighter than No. 16. Hot sheets are being offered in the same widths and in the same gages, but major requirements are for the wider sizes and lighter gages. It appears doubtful if the mill can get equipment into operation for producing sheets wide

Steel Exports Gain In 1952 Reported

Total falls 47.5 per cent below record high movement set in 1940 despite 27 per cent rise over preceding year. Ingots and semifinished constituted largest category shipped

New York — Steel product exports from the United States in 1952 totaled 4,160,000 net tons, gain of about 882,000, or 27 per cent, over the previous year, reports the American Iron & Steel Institute. In spite of the gain, the year's total was 47.5 per cent below the record high of 7.9 million tons exported in 1940.

For the first time since World War II, steel ingots and semifinished products constituted the largest category exported, amounting to nearly 731,000 tons. These large exports of such products resulted from an agreement with Great Britain calling for exchange of certain nonferrous metals for steel.

Other leading steel products exported in 1952 were: Tin plate, 522,500 tons; sheets, 554,000; welded pipe, 32,500 tons; plates, 295,000 structural shapes, 284,500; seamless pipe, 273,000 tons. Of these, welded and seamless pipe and plates showed an increase over exports in 1951.

North America ranked first as a consumer of steel from the United States. Canada was the largest single importer from this country.

Market changes for steel products from the United States showed Europe taking 1,159,000 tons of the total, an increase of about 170 per cent over that reported in 1951. European countries constituted the second largest market and South America ranked third. Both South America and Asia, the fourth ranking consumer, took less tonnages than in 1951. African countries took 127,500 tons.

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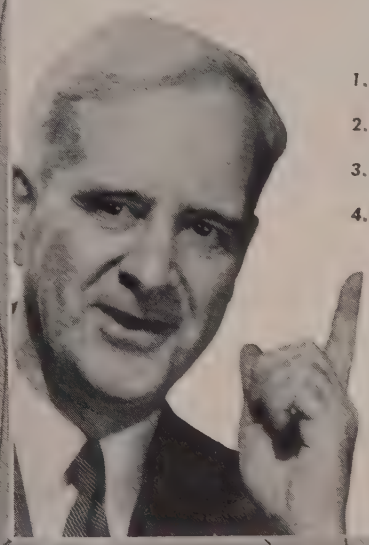

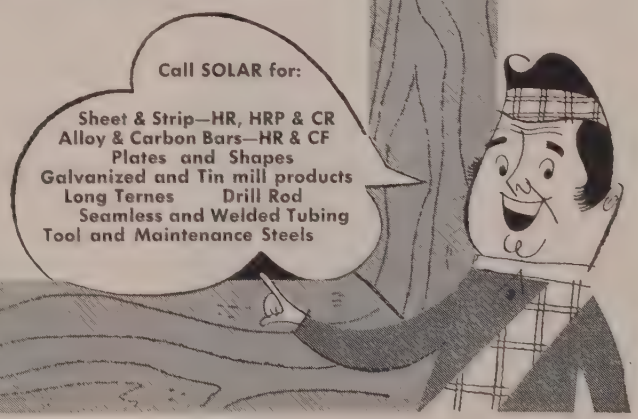
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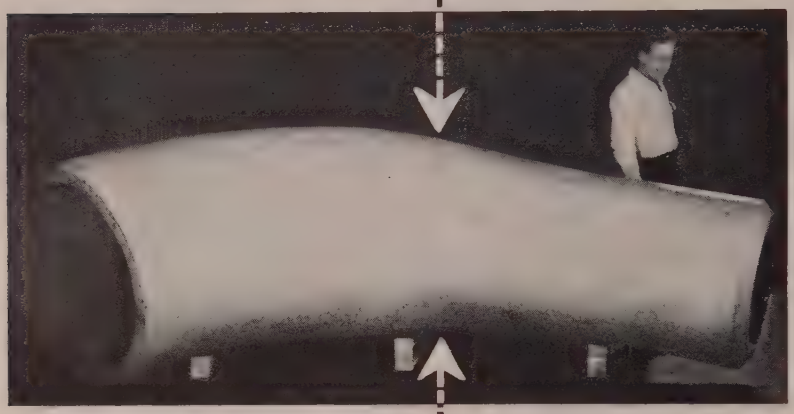
DURALOY

This Casting



Casting weight
21,000 pounds

Shipping weight
14,000 pounds

Alloying Elements
38% Ni., 18% Cr., 2% Mo.

Set a Record!

It's the weight rather than the Ni-Cr content that's the record.

We've cast many a piece with such a high Ni-Cr combination. But this represents the largest casting we have ever made. And it took careful scheduling of our entire battery of electric furnaces, with a double melt from two smaller furnaces.

Next followed a thorough X-ray for hidden flaws with our 400,000 volt unit. Then rough-finishing to specifications.

The significant fact is that this casting, the first of this size we have ever produced and destined for a most important high priority processing job, passed inspection with flying colors. *There was no reject here.* It is indicative of the skill of our metallurgists and foundrymen in turning out high alloy castings.

If you are looking for this kind of service, make Duraloy your casting source.

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hot sheets for delivery before December and 72-inch hot sheets before some time in first quarter next year.

Producers of electrical sheets and enameling stock report brisk demand and add, that while galvanized sheet specifications are not too heavy, they are better than a few weeks ago.

Pittsburgh—A new sheet-strip producer, Pittsburgh Steel Co., reports fourth quarter order books are filling rapidly with no weakness noted in this market. An excellent fourth quarter is predicted for products of the $28-million Allenport, Pa., hot mill.

Philadelphia—Encouraged by a banner year in 1952, and another heavy demand year currently, air conditioning equipment manufacturers are active in their preparations for 1954.

Their main production periods are in the first and fourth quarters and, in getting ready for next year, they are now after the sheet mills for tonnage for fourth quarter delivery.

Cincinnati — Conflicting trends remain a predominant factor in the sheet and strip picture. Cutbacks in orders persist at the mill level, but some large users are sustaining demand with big orders. Warehouses are hard pressed for sheets in many cases.

Detroit—Detroit Steel Corp.'s $60 million expansion program at its Portsmouth, O., plant is scheduled for completion in January, 1954. New hot strip and cold mill facilities are already in operation. The new 1400-ton blast furnace is being readied for lighting before Sept. 1. Bricking of the four new 250-ton open hearths is progressing rapidly, and the new blooming mill and soaking pit projects are expected to be finished in January.

Chicago—Except for some easing in demand for the lower grades of electrical sheets all sheet products are very tight. A decline in output of certain types of motors like for washing machines explains the electrical sheet softening. It is generally agreed that it is automotive pressure that is keeping sheet demand so solid. The Korean truce isn't expected to exert any influence this year because military production schedules undoubtedly will be maintained at high level for months to come.

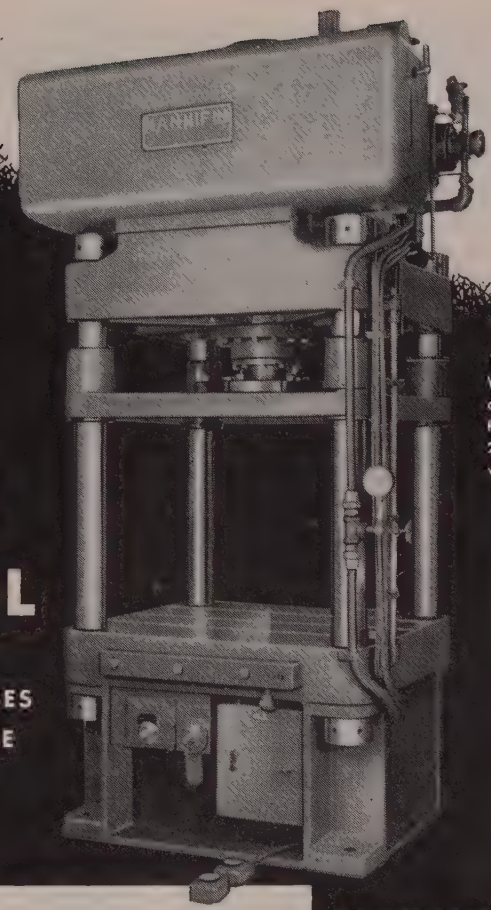
Tubular Goods . . .

Tubular Goods Prices, Page 151

Los Angeles — With pipe users' inventories of tubular goods limited, pipemakers forecast a narrowing of the gap between supply and demand by end of fourth quarter. Meanwhile Japanese tubular goods of good quality are available for stop-gap use.

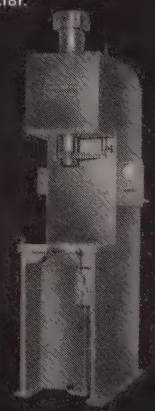
IT'S ALL A MATTER OF CONTROL

HANNIFIN HYDRAULIC PRESSES CAN BE EQUIPPED WITH THE *CONTROLS YOU NEED*



150-TON FOUR-COLUMN PRESS—Semi-automatic cycle. Advance at high speed, feed stroke starting at pre-set point in stroke and automatic reversal. Self-contained unit with reservoir, hydraulic pumps and control valves on top of press. Dual electric push buttons.

15-TON FORCING PRESS—With built-in hydraulic power unit and exclusive, patented Sensitive Pressure Control. Gap, 22"; stroke, 21"; reach, 10"; table, 19" x 22" with U slot.



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One outstanding Hannifin development is patented Sensitive Pressure Control . . . standard equipment on Hannifin straightening and forcing presses. But Hannifin also offers conventional manual control, adjustable for maximum pressure, and a wide range of electric push button controls. Rapid advance followed by slow feed stroke, automatic reversal on time, pre-set pressure, or distance, all are available when needed. Ram speed control can be supplied as an optional extra feature with any of these controls, and cycling can be automatic or semi-automatic.

Chances are you can select the right press, and the type of control you need, directly from Hannifin's catalog . . . it lists more than 75 models, capacities from 1 ton to 150 tons. However, if your requirements are special, a Hannifin Field Engineer will analyze them, then recommend the exact control, or combination of controls, to do the job. Why not consult with him? Hannifin Corporation, 1123 S. Kilbourn Ave., Chicago 24, Ill.

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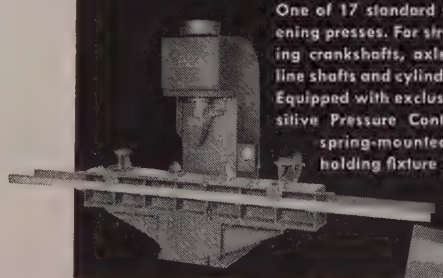

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Steel Bars . . .

Bar Prices, Page 148

Boston—Reduction in military requirements during fourth quarter will open additional alloy bar volume for civilian use. Orders for the final quarter are coming in at a slower rate than for third quarter, and openings in schedules are reported available for November and December in both hot-rolled and cold-finished alloy bars.

Hot-rolled carbon bar schedules are further extended. Cold-finishers, however, are building inventories and some slackening in hot-rolled tonnage requirements of converters is indicated. Carbon bars are easing in a larger range of sizes and alloy specifications are broadening to include more grades, nickel excepted.

With production expected by late October, orders for hot-rolled bars, small sizes, are developing for the Fairless, Pa., Works of U. S. Steel Corp.

New York—While the Office of Defense Mobilization has announced a reduction in over-all steel allotments for military needs in fourth quarter, hot bar producers doubt if action will have much bearing on their production. Actually, there are persistent rumors that shell requirements will be stepped up over the remainder of the year and, if so, this will have a tightening, rather than an easing effect, on bars. In any event, producers expect continued stringency in sizes of 2½ inches and over. They are confident they will be able to sustain good operations on virtually all sizes.

Cold drawers, as well as hot bar producers, appear generally optimistic over the outlook for remainder of the year.

Philadelphia—The Korean truce will not likely affect demand for shell steel over remainder of this year. At least most bar sellers anticipate little change, and in general look for an active fourth quarter, not only in the larger sizes, especially shell needs, but in the smaller diameter bars as well.

Pittsburgh—For the first time in several months, some industry groups such as producers of agricultural implements and fasteners have succeeded in getting enough bars to satisfy their demand and build up inventories.

As orders from truck producers fall off slightly, other industries increase their orders, creating a favorable environment for barmakers. Manufacturers here say third quarter order books are full and fourth quarter books are filling at a brisk rate.

Cleveland—Silencing of the guns

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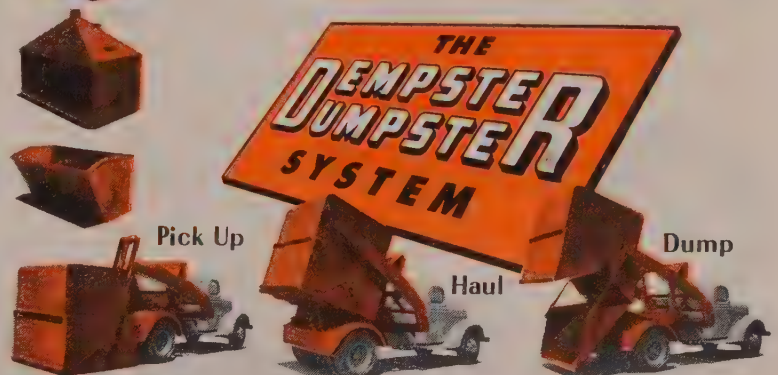

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in Korea is not expected to have much, if any, immediate effect on demand for bars on military and related account in the immediate future. In view of the avowed intention of the government to maintain the defense program in high gear, barmakers do not anticipate early cutbacks in present shell and military equipment programs which would result in a flood of order cancellations for steel.

Currently, the bar mills are booked full for third quarter and new business is coming in for fourth quarter at a brisk rate.

Cincinnati—Carbon and alloy bars have taken off in opposite directions so far as supply and demand are concerned. Carbon bars continue scarce under heavy requirements. But alloy bars are in the best inventory position for quite some time.

Los Angeles — Manufacturers of shells and fuzes are taking large quantities of bars. Fabricators' requirements are tapering and warehouses are not taking up allocations.

Plates . . .

Plate Prices, Page 148

Philadelphia — Plate demand still runs ahead of supply. Shipwork is tapering more and more with each passing month, but there is a continued strong demand from tank and boiler manufacturers and pipe fabricators. Producers look for a good market over the remainder of the year.

The Conshohocken, Pa., producer expects to suspend around the middle of the month for two weeks mass vacation. This, naturally, will cut into deliveries from this point. On the other hand, deliveries are being stepped up at Claymont, Del., as soaking pit capacity is increased. Another month should see this latter program completed.

Boston — Plate fabricating shops are placing fourth quarter orders with the assurance more tonnage will be available in wanted sizes and grades. Improvement in the supply includes heavier plates for weldments.

Tank shops are taking in more tonnage, although light and narrow plates are in somewhat tight supply. Loss of production from strip-sheet mills partially accounts for this. Another factor is the heavy order load for medium and larger sizes as well as quality tonnage on the standard plate mills.

Weldment shop backlogs range up to three months.

Pittsburgh — Platemakers report orders surpass quotas and probably will throughout fourth quarter. Although orders are at a slightly lower level than they were six months ago, producers expect a three to four-

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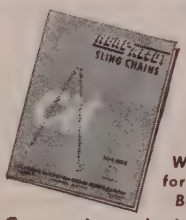

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Sling Chains are registered by individual serial number and can be rebuilt or replaced at any time to original specifications.

The Allegheny Ludlum Steel Corp., pictured above, uses Herc-Alloy Sling Chains for hundreds of tough lifting jobs in its plants. In addition to maximum safety, Allegheny Ludlum also enjoys the extra economy of longer-lasting Herc-Alloy. These sling chains offer still another advantage...a weight reduction unmatched by any other alloy chain without any sacrifice in tensile strength. This reduces worker fatigue. All things considered, don't you think Herc-Alloy Sling Chains are worth a try in your plant.

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week carryover into the final quarter, with no decline in production.

One industry member, returning from a swing through the country, found that all plate producers he spoke to were optimistic about business for the balance of the year.

Chicago — Plate fabricators have heavy shop schedules and are unable to get plates delivered from the mills in sufficient tonnages, sizes and grades, to permit complete freedom of use. Inventories are scant and show indications of remaining so since the mills see no prospects for increasing customer quotas soon. Most plate fabricators have bookings into 1954.

Pig Iron . . .

Pig Iron Prices, Page 144

New York—Blast furnace production of pig iron and ferroalloys set a six-month record in the first half of 1953, the American Iron & Steel Institute reports. Output of 38,313,549 net tons surpassed the highest previous six months, the second half of 1951 by 2 million tons. The gain was 8.4 million tons over the first half of 1952, when production was cut by the steelworkers' strike.

The June, 1953, blast furnace output of 6,372,531 tons was a record for any 30-day month.

Details on production in the first half follow:

BLAST FURNACE OUTPUT
(Net Tons)

1953	Pig Iron	Ferroalloys	Total
Jan.	6,482,081	83,302	6,564,383
Feb.	5,813,202	68,316	5,881,518
Mar.	6,611,040	66,321	6,677,361
Apr.	6,171,939	58,702	6,230,641
May	6,519,082	68,033	6,587,115
June	6,297,559	74,972	6,372,531
1st Half	37,894,903	418,646	38,313,549
1952			
June	1,056,278	12,003	1,068,281
1st Half	29,621,004	288,038	29,909,042

New York—District foundries are recovering from vacations to some extent and accordingly are consuming more pig iron. Sellers of iron say, however, that business will not pick up to pre-summer levels until after Labor Day, as warm weather and vacations will continue retarding factors for another few weeks.

Philadelphia — An increasing amount of foreign pig iron is being offered. Some lots of reportedly good standard basic and foundry material are being quoted around $50 f.o.b. Philadelphia, duty paid. Demand for foundry iron, however, still lags.

Pittsburgh—Pig iron demand continues its summer slump due to vacations at foundries and other seasonal factors. Blast furnaces in this area are operating near capacity, producing a surplus of pig iron over current orders. Producers of ingot

(*Please Turn to Page* 169)

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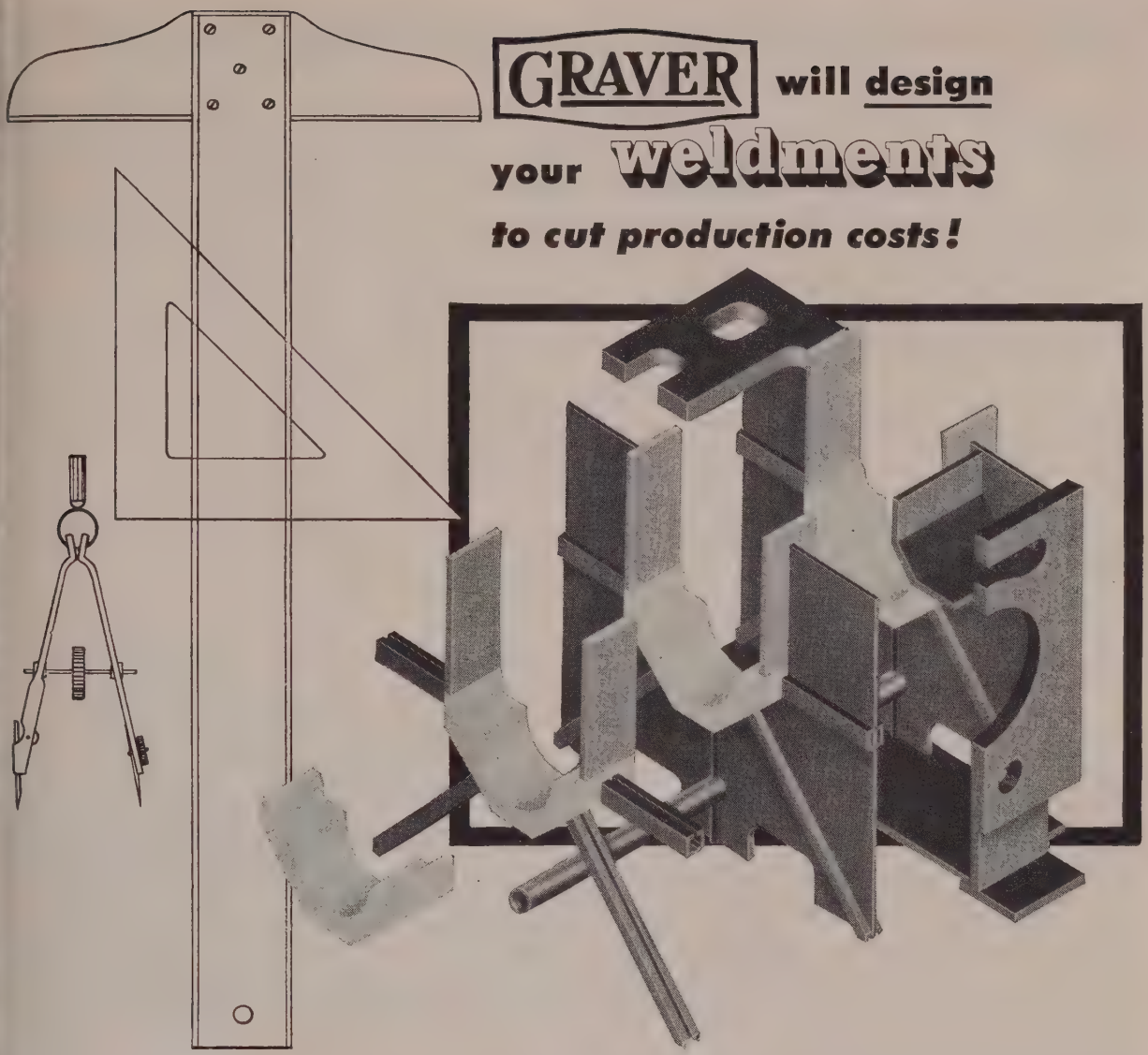

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Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $85, Palmerton, Pa.; $85, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Etna, Johnston and Sheridan, Pa.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.
(Mn 76-80%) 13.15c per pound of contained Mn, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.
(Mn 79-81%) Lump, $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 30c; ton lots, 32c; 250 to 1999 lb, 34c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max. Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High - Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l., packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.025c C (simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. 8 M x D, bulk, 26.25c per lb of contained Cr C.l., packed 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon, F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max.) 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%; Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 10,000 lb W or more, $4.35 per lb of contained W; 2000 lb W to 10,000 lb W, $4.45; less than 2000 lb W, $4.57, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max C 0.4% max). Contract, ton lot, 2" x D $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb o contained Cb plus Ta, deld.; less ton lot $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8% Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloa packed, 1" x D, 45c per lb of alloy, ton lo 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7% Fe 20% approx). Contract, carload, packed ½" x 12 M, 17.5c per lb of alloy, ton lot 18.25c, less ton 19.5c. Deld. Spot, add 0.25c

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9 11%). C.l. packed, 17.50c per lb of alloy; to lots 18.50c; less ton lots 20c, f.o.b. Niagar Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19% Mn 8-11%). C.l. packed 15c per lb of alloy ton lots 16.50c; less ton lots 17.75c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; ba Fe) Lump, carload, bulk 14.50c, packed 15.50c ton lots, packed, 15.75c; less ton lots, packe 16.25c per lb of alloy, delivered to destinatio within United States.

Ferrophosphorus: (23-25% based on 24% content with unitage of $3 for each 1% of above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $6 per gross ton.

Ferromolybdenum: (55-75%). Per lb co tained Mo, f.o.b. Langeloth, $1.32 in all siz except powdered which is $1.41; Washingto Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contain Mo, f.o.b. Langeloth, Pa., $1.14 in cans; bags, $1.13, f.o.b. Langeloth, Pa.; Washin ton, Pa., $1.13.

Are retained lubrication and long bearing life vital?

here's how leading harvesting machine manufacturers secure them with NEEDLE BEARINGS

Torrington Needle Bearings are important design features on many harvesting machines because of their unique ability to retain lubricants, and because of their long service life.

They have been *performance-proved* in machines which handle a wide variety of crops, on every type of soil and terrain—including combines, corn or cotton pickers, mowers and other miscellaneous harvesting equipment.

Needle Bearings in such machines are found in main drives, gearboxes, crankshafts, bell cranks, idler pulleys, sprockets, steering gears and various linkages. The small but rugged Needle Bearing has capacity for long life under punishing loads and severe operating conditions always present in the use of such equipment. Furthermore, the turned-in lips of the Needle Bearing's outer shell retain lubricants for long periods—reducing down time for relubrication to a minimum.

Needle Bearings have become "standard equipment" throughout industry since their introduction nearly twenty years ago. Their low cost, small size, and ease of installation make them the natural choice for increasing numbers of anti-friction applications.

Torrington Needle Bearings may offer a solution to your bearing problems. Our engineers will be glad to help you find out.

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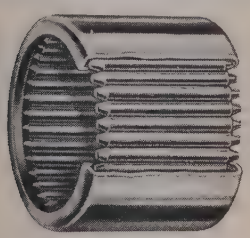

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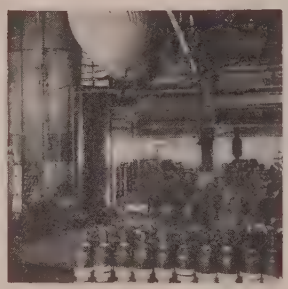

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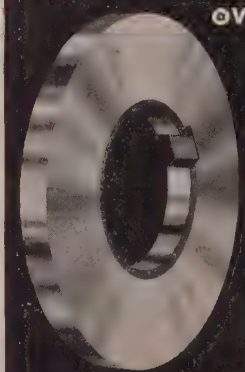

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COWLES TOOL COMPANY
2086 W. 110th ST. CLEVELAND 2, OH

Pig Iron . . .

(*Continued from Page* 164)

molds enjoy a steady rate of orders.

Cleveland—While pressure on merchant iron sellers is off somewhat with vacations and other seasonal factors restricting foundry operations, tonnage is moving steadily and no piling of iron at furnaces is reported. Expectations are there will be a gradual stepup in iron requirements as the vacation season wanes and full schedules are resumed.

The trade is closely watching for developments in the automotive industry that will point the way demand will go in fourth quarter.

Youngstown — Twenty-four blast furnaces are currently in operation in this district. The job of relining the Sharon Steel Corp.'s Mary furnace at Lowellville, O., has been completed leaving one stack inactive in the area. That is the Anna furnace at Struthers, O., of the Pittsburgh Coke & Chemical Corp., Pittsburgh.

Cincinnati—Pig iron appears readily available here. Demand is off due to vacations. As a result of easing supply and demand, the market is quiet.

Chicago—Despite vacation closing of foundries, demand for pig iron remains good and sellers have moved all tonnage available from furnaces. Come September, iron supply will be increased as some blast furnaces now under repair resume. Strength of the present situation hinges on the automobile industry.

Of the district's 43 blast furnaces 40 are active.

Iron Ore . . .

Iron Ore Prices, Page 169

Cleveland—The lake shipping season is at its peak, and iron ore is coming down to lower lake ports in record volume. Continuance of the current weekly rate of shipments through remainder of the season will mean a new all-time tonnage record will be achieved in 1953.

Shipments in the latest week, that ended July 27, set a new weekly high for the season to date, according to the Lake Superior Iron Ore Association totaling 3,342,127 gross tons. In the like week a year ago the movement was reported at only 135,434 tons, lake shipping at that time being at a virtual standstill because of the steel strike.

Season shipments to date of ore from upper lake ports amount to 48,419,086 gross tons, comparing with 22,035,442 tons in the like period of the 1952 shipping season.

MARKET PRICES

ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail or vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom
Long-term contract	22.00
North African hematites (spot)	24.00-26.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$55.00
Domestic scheelite, mine	63.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.21 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 90-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom. $32

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $99.30; Salina, Pa., $104.55; Niles, O., $109; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $99.30; Hays, Pa., $105.10; Niles, O., $107; E. Chicago, Ind., Joliet, Rockdale, Ill., $109.70; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $179.55; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $69.30; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $92.40; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $127; Johnstown, Pa., $127.30; Clearfield, Pa., $135; St. Louis, $138; Athens, Tex., $140.90.

Nozzles

Reesdale, Pa., $203.20; Johnstown, Pa., $208.40; Clearfield, Pa., $219.45; St. Louis, $224.65; Athens, Tex., $225.20.

Runners

Reesdale, Pa., $158.20; Johnstown, Pa., $161.70; Clearfield, Pa., $168.60; St. Louis, $170.30; Athens, Tex., $174.40.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico Mo., $166.30; Danville, Ill., $169.30.
60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $210.20; Danville, Ill., $213.20.
70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $244.85; Danville, Ill., $247.85; Clearfield, Pa., $252

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00
New River foundry	20.80
Wise county foundry	15.95
Wise county, furnace	15.20

Oven Foundry Coke

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.00
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	26.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	21.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.55 freight zone from works

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44-45
Birmingham area	$49.50

Cents per pound, ovens

Phenol, 40 (carlots, nonreturnable drums)	17.25

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

APEX TOOLS

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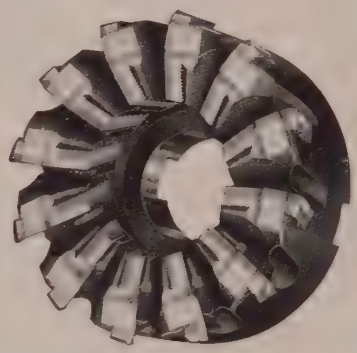

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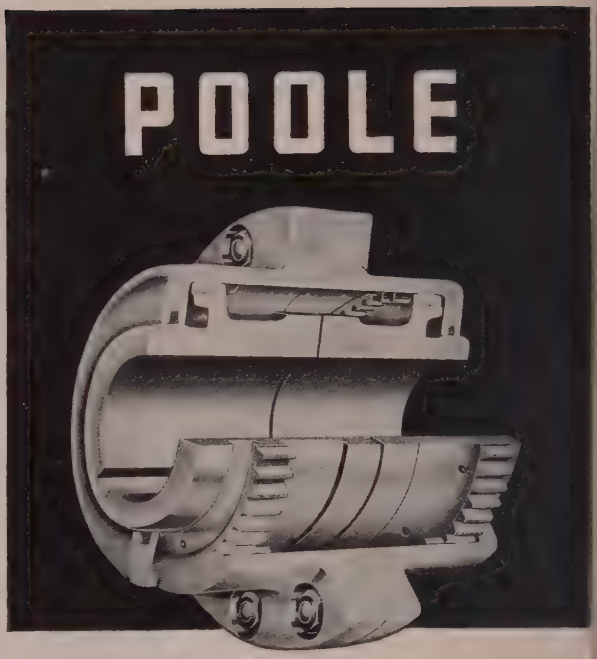

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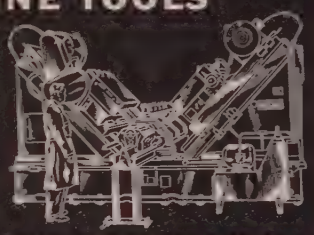

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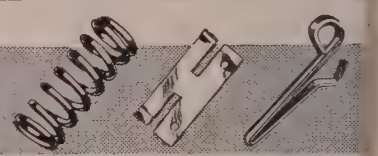

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50th ANNIVERSARY

Semifinished Steel . . .

Semifinished Prices, Page 148

Chicago—Scheduled at 95 per cent of capacity for the week ended Aug. 1, ingot operations in this district were down 4.5 points from the revised rate of 99.5 per cent the previous week.

The lower rate was due entirely to repairs and maintenance work to furnace equipment at several plants, but principally at units of U. S. Steel Corp.

Shipments of finished and semifinished steel from plants of Inland Steel Co. during the second quarter of 1953 totaled 957,701 net tons, 3 per cent more than the former record amount of 930,498 tons shipped in the first quarter of 1951.

Conversion of steel supplied by customers accounted for 8 per cent of the company's shipments during the second quarter. Conversion is expected to continue at about the same rate during the third quarter, but none has been contracted for beyond that period.

Inland expects operations to be at or near capacity through third quarter, and possibly throughout the rest of the year.

St. Louis—A half-year production record was set by Granite City Steel Co. in the first half of 1953. It produced 403,000 net tons of basic steel, 13,000 more than the company's previous half-year record set in 1951. The company's $68 million expansion program is nearing completion.

Dallas, Tex.—Four new open-hearth furnaces have been completed for the Lone Star Steel Co., Lone Star, Tex. The furnaces, according to the Rust Furnace Co., Pittsburgh, are part of Lone Star Steel's $87 million expansion of steelmaking facilities.

Scrap . . .

Scrap Prices, Page 174

Chicago—Principal grades of steelmaking scrap rose $1 and $2 a ton when an important consumer in the district purchased for August delivery. Tonnage involved was smaller than expected but it made formal some of the prices which brokers have been forced to pay for material to complete July deliveries.

No. 1 factory bundles, No. 1 dealer bundles and No. 1 heavy melting steel increased $2 a ton, No. 2 bundles and No. 1 railroad heavy melting steel gained $1.

Scrap production continues to show effects of vacation closings.

New York—Brokers have advanced buying prices on No. 2 bundles to a spread of $29.00 to $29.50 and have boosted prices slightly on No. 1 cupola cast to a range of $33 to $34. Korean truce was previously discounted and

THOMAS *Heavy Duty* Billet Shears are built in capacities from 500 to 2000 tons, with the primary objective of delivering to the user many years of efficient, trouble-free service. *And they do!*

Write for Bulletin 311

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Says V. James DeNaples,
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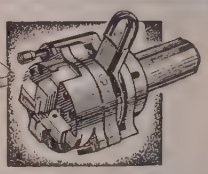

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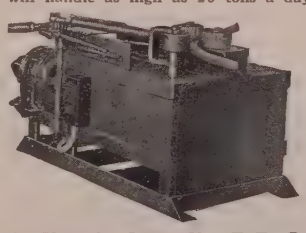

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appears now to be affecting sentiment little one way or the other.

Philadelphia—The Korean truce has had little or no effect on scrap prices, although sentiment, as has been true for the past couple of weeks, continues slightly mixed. Prime grades of open-hearth steel are unchanged, No. 2 heavy melting steel prices continue steady. Only on No. 2 bundles has there been a change—an increase to $35.50 to $36 delivered, reflecting purchases at Morrisville, Pa. Turnings and borings and low phos scrap prices are unchanged; also leading cast iron grades.

Steel scrap shipments for Conshohocken, Pa., are to be held up shortly in anticipation of a two weeks suspension for mass vacations, beginning around the middle of this month. All truck shipments end Aug. 7 and all deliveries by rail have to be in by Aug. 14, according to present schedules.

Pittsburgh — Little active buying by large mills in this area is noted and the scrap market continues dormant. Some trade interests think active buying of open-hearth scrap grades could take place at lower than the present price levels. Prices, however, remain firm.

Cleveland — The scrap trade is marking time for the present awaiting developments that will point the way for the market over coming weeks. Signing of the Korean truce has been accompanied with a certain degree of uncertainty with some trade interests anticipating a slowing down in the defense program and resulting easing in pressure for scrap and other raw materials.

There is nothing as yet to support this view, but trade sentiment is definitely less bullish than it was a month back and dealers are moving material out of their yards as quickly as possible.

Meanwhile, prices are firm at levels recently established on July sales of No. 1 heavy melting at $45 to $46. Some August purchases of No. 2 heavy melting at $42 and No. 2 bundles at $40 for delivery to a Valley mill were reported last week.

Something of a paradox prevails in the market at the moment, and it has brokers puzzled. In the face of an apparent easier tendency with brokers' offerings to the mills at prevailing or even slightly lower prices being largely ignored, automotive production scrap last week was bid in at even higher prices than were obtained on the last lists.

Cincinnati — The market is quiet with all prices unchanged. Prices for open-hearth grades are expected to remain the same in August.

Detroit—Scrap lists were closed last week but the prices at which purchases were made were not announced immediately. Most scrap men feel that prices may be up somewhat on most grades.

Los Angeles—The scrap market has settled deeper into the doldrums with tonnage movement reduced by 55 per cent. Dealers claim at prevailing price levels they can't fill even minimum requirements of commitments. Kaiser Steel Corp., Fontana Works, is back in the market for small tonnages. Foundry requirements are sluggish and the price on No. 1 cupola cast is $1 less at $37 to $40.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

650 tons, laboratory, Malpar, Inc., Falls Church, Va., to Bethlehem Steel Co., Bethlehem, Pa.; Charles H. Tompkins Co., Washington, general contractor.

280 tons, warehouse, Slyvania Electric Products Inc., Seneca Falls, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

210 tons, junior high school, Ridley township near Philadelphia, to Easton Steel Structurals, Easton, Pa.

101 tons, state bridge, Tioga county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, addition, Rhode Island hospital, Providence, R. I., to A. O. Wilson Structural Co., Cambridge; Gilbane Building Corp., Providence, general contractor; 500 tons, reinforcing, to Plantations Steel Co., Providence.

100 tons, state bridge, bars included, Taunton, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Coleman Bros. Co., Boston, general contractor.

STRUCTURAL STEEL PENDING

3000 tons, 22-story Emery Roth office building, 40th St. and Broadway, New York, bids asked.

20,000 to 25,000 tons, estimated, 42-story Socony-Vacuum office building, between Lexington and Third Avenues and 41st and 42nd streets, New York; plans expected out early in fall; owner is Galbreath Corp., 150 East 43rd street; architects are Harrison & Abramovitz; and builders will be the Turner Construction Co., both with offices in New York.

275 tons, continuous plate girder bridge, Boston & Albany railroad, West Springfield, Mass.

225 tons, approaches, Hunt's Falls bridge, Lowell, Mass., Coleman Bros. Co., Boston, low on general contract.

218 tons, state bridge, Bucks county, Pennsylvania; Harry Erb, Balacynwyd, Pa., low on general contract.

175 tons, state highway bridge, Burlington, Mass.; bids in.

Unstated tonnage, city prison, Brooklyn, New York City Department of Public Works, bids asked.

REINFORCING BARS . . .

REINFORCING BARS PLACED

950 tons, dining hall, kitchen and dormitory, Louisiana state prison, Angola, La., to Joseph H. Fox & Co., Birmingham, Ala., R. P. Farnsworth & Co., New Orleans, general contractor; Sherwood Moore Iron Works, Birmingham, structural steel.

500 tons, laboratory, Malpar, Inc., Falls Church, Va., to Bethlehem Steel Co., Bethlehem, Pa.; Charles H. Tompkins Co., Washington, general contractor.

500 tons, bars and shapes, two dormitories, Tulane University, New Orleans, La., to Joseph H. Fox Co., Birmingham, Ala.,

(*Please Turn to Page* 176)

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

July 30	$43.92
July 23	43.42
June avg.	40.50
July 1952	42.60
July 1948	41.43

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	44.00-45.00
No. 2 heavy melting	43.00-44.00
No. 1 bundles	44.00-45.00
No. 2 bundles	41.00-42.00
No. 1 busheling	44.00-45.00
Machine shop turnings	27.00-28.00
Mixed borings, turnings	*30.00-31.00*
Short shovel turnings	31.00-32.00
Cast iron borings	30.00-31.00
Cut structurals	48.00-49.00
Heavy turnings	*41.00-42.00*
Punchings & plate scrap	49.00-50.00
Electric furnace bundles	48.00-49.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Charging box cast	42.00-43.00
Heavy breakable cast	40.00-41.00
Unstripped motor block	35.00-36.00
No. 1 machinery cast	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00
Rails, 2-ft. and under.	53.00-54.00
Rails, 18-in. and under	54.00-55.00
Rails, random lengths	49.00-50.00
Rails specialties	51.50-52.50

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	45.00-46.00
No. 2 heavy melting	41.00-42.00
No. 1 bundles	45.00-46.00
No. 2 bundles	39.00-40.00
No. 1 busheling	45.00-46.00
Machine shop turnings	24.00-25.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	28.00-29.00
Cast iron borings	28.00-29.00
Low phos.	46.00-47.00
Alloy free, short shovel turnings	31.00-32.00
Electric furnace bundles	45.00-46.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Charging box cast	44.00-45.00
Stove plate	43.00-44.00
Heavy breakable cast	38.00-39.00
Unstripped motor blocks	27.00-28.00
Brake shoes	38.00-39.00
Clean auto cast	46.00-47.00
No. 1 wheels	40.00-41.00
Burnt cast	35.00-36.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00
R.R. Malleable	49.00-50.00
Rails, 3-ft. and under.	52.00-53.00
Rails, 18 in. and under	55.50-56.50
Rails, random lengths	48.50-49.50
Cast steel	50.00-51.00
Railroad specialties	52.00-53.00
Uncut tires	51.00-52.00
Angles, splice bars	52.50-53.50
Rails, rerolling	55.00-56.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	45.00-46.00
No. 2 heavy melting	42.00-43.00
No. 1 bundles	45.00-46.00
No. 2 bundles	40.00-41.00
Machine shop turnings	26.00-27.00
Short shovel turnings	31.00-32.00
Cast iron borings	31.00-32.00
Low phos.	48.00-49.00
Electric furnace bundles	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	48.00-49.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	44.00-44.50
No. 2 heavy melting	39.00-39.50
No. 1 bundles	44.00-44.50
No. 2 bundles	*35.50-36.50*
No. 1 busheling	44.00-44.50
Electric furnace bundles	44.50-45.50
Machine shop turnings	28.00
Mixed borings, turnings	32.00
Short shovel turnings	34.00
Structurals & Plate	46.00-47.00
Heavy turnings	42.00-43.00
Couplers, springs, wheels	50.00-51.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Charging box cast	40.00
Heavy breakable cast	43.00
Unstripped motor blocks	32.00
Drop broken machinery	47.00-48.00

NEW YORK

(Brokers' Buying Prices)

No. 1 heavy melting	37.00-37.50
No. 2 heavy melting	31.00-32.00
No. 2 bundles	*29.00-29.50*
Machine shop turnings	20.00
Mixed borings, short turnings	22.00-23.00
Low phos. (structural & plate)	39.00-40.00
Shovel turnings	23.00-24.00

Cast Iron Grades

No. 1 cupola	*33.00-34.00*
Unstripped motor blocks	25.00-26.00

DETROIT

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 bundles	*40.00-41.00*
No. 2 bundles	31.00-32.00
No. 1 busheling	35.00-36.00
Machine shop turnings	*19.00-20.00*
Mixed borings, turnings	20.00-21.00
Short shovel turnings	*22.00-23.00*
Punchings & plate scrap	*41.00-42.00*

Cast Iron Grades

No. 1 cupola	43.00
Changing box cast	34.00-35.00
Stove plate	34.00-35.00
Heavy breakable	29.00-30.00
Unstripped motor blocks	30.00
Clean auto cast	42.00-43.00
Malleable	44.00

CINCINNATI

(Brokers' Buying Prices)

No. 1 heavy melting	44.00
No. 2 heavy melting	40.00
No. 1 bundles	44.00
No. 2 bundles	38.00
No. 1 busheling	44.00
Machine shop turnings	23.00*
Mixed borings, turnings	25.00*
Short shovel turnings	27.00*
Cast iron borings	25.00*

Cast Iron Grades

No. 1 cupola	45.00
Charging box cast	40.00
Heavy breakable cast	40.00
Drop broken machinery	50.00

Railroad Scrap

No. 1 R.R. heavy melt.	*46.00*
Malleable	47.00
Rails, 18-in. and under	55.00
Rails, random lengths	48.00

*F.o.b. shipping point.

CHICAGO

No. 1 heavy melting	*43.00-44.00*
No. 2 heavy melting	*39.00-40.00*
No. 1 factory bundles	*44.00-45.00*
No. 1 dealer bundles	*43.00-44.00*
No. 2 bundles	*36.00-37.00*
No. 1 busheling	*43.00-44.00*
Machine shop turnings	22.00-23.00
Mixed borings, turnings	23.00-25.00
Short shovel turnings	24.00-26.00
Cast iron borings	23.00-25.00
Cut structurals	*46.00-47.00*
Punchings & plate scrap	45.00-47.00
Electric furnace bundles	43.00-44.00

Cast Iron Grades

No. 1 cupola	40.00-42.00
Stove plate	35.00-37.00
Unstripped motor blocks	35.00-37.00
Clean auto cast	45.00-47.00
Drop broken machinery	45.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	*46.00-47.00*
R.R. Malleable	43.00-45.00
Rails, 2-ft. and under	53.00-54.00
Rails, 18-in. and under	55.00-56.00
Angles, splice bars	51.00-52.00
Rails, rerolling	*55.00-56.00*

BIRMINGHAM

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	27.00-28.00
No. 1 bundles	29.50-30.50
No. 2 bundles	29.00-30.00
Machine shop turnings	20.75-21.75
Short shovel turnings	22.75-23.75
Cast Iron borings	22.75-23.75
Cut structurals	39.00-40.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	39.00-40.00
Charging box cast	30.00-31.00
Stove plate	35.00-36.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
Rails, 2-ft and under.	45.00-46.00
Rails, random lengths	42.00-43.00
Angles, splice bars	45.00-46.00
Rails, rerolling	45.00-46.00

ST. LOUIS

(Brokers' Buying Prices)

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	36.00-38.00
No. 1 bundles	39.00-40.00
No. 2 bundles	34.00-36.00
Machine shop turnings	19.00-20.00
Short shovel turnings	21.00-22.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	35.00-36.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	35.00-36.00
Brake shoes	41.00
Clean auto cast	44.00
Burnt cast	34.00-35.00

Railroad Scrap

Malleable	36.00
Rails, 18-in. and under	53.00-55.00
Rails, random lengths	48.00-50.00
Uncut tires	46.00
Angles, splice bars	46.00-47.00
Rails, rerolling	51.00-53.00

BUFFALO

No. 1 heavy melting	43.50-44.00
No. 2 heavy melting	40.00-40.50
No. 2 bundles	38.00-38.50
No. 1 bundles	43.50-44.50
No. 1 busheling	43.50-44.50
Machine shop turnings	26.00-27.00
Mixed borings, turnings	31.50-32.00
Short shovel turnings	31.50-32.00
Cast iron borings	31.50-32.00
Low phos.	47.50-48.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	40.00-41.00
No. 1 machinery	44.00-45.00

Railroad Scrap

Rails, random lengths	48.50-49.00
Rails, 2 ft and under	53.50-54.00

BOSTON

(Brokers' Buying Prices; f.o.b. shipping points)

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	*30.00-31.00*
No. 1 bundles	*33.00-34.00*
No. 2 bundles	*28.00-29.00*
Machine shop turnings	*18.50-19.00*
Mixed borings, turnings	*21.00-22.00*
Short shovel turnings	*22.00-23.00*
No. 1 cast	30.00-31.00
Mixed cupola cast	26.00-28.00
No. 1 machinery cast	38.00-39.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	31.00
No. 2 heavy melting	27.00
No. 1 bundles	29.00
No. 2 bundles	23.00
No. 3 bundles	19.00
Machine shop turnings	13.00
Mixed borings, turnings	13.00
Short shovel turnings	13.00
Electric Furnace, No. 1	38.00-40.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	30.00-35.00
Unstripped motor blocks	27.00
No. 1 wheels	38.00-40.00
Stove plate	26.00

Railroad Scrap

Rails, random lengths	34.00-35.00

SAN FRANCISCO

No. 1 heavy melting	28
No. 2 heavy melting	24
No. 1 bundles	25
No. 2 bundles	22
No. 1 busheling	28
Machine shop turnings	19
Mixed borings, turnings	29
Short shovel turnings	29
Cast iron borings	29
Cut structurals	38
Heavy turnings	34
Punchings & plate scrap	37
Electric furnace bundles	37

Cast Iron Grades

No. 1 cupola	39
Charging box cast	47
Stove plate	46
Heavy breakable cast	45
Unstripped motor blocks	41
Brake shoes	41
Clean auto cast	52
No. 1 wheels	47
Burnt cast	41
Drop broken machinery	52

Railroad Scrap

No. 1 R.R. heavy melt.	37
Malleable	55
Rails, 3-ft and under.	42
Rails, 18-in. and under	45
Rails, random lengths	39
Cast steel	40
Uncut tires	39
Angles, splice bars	42
Rails, rerolling	44

LOS ANGELES

No. 1 heavy melting	24
No. 2 heavy melting	20
No. 1 bundles	23
No. 2 bundles	20
Machine shop turnings	8

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	*37.00-40*

HAMILTON, ONT.

(Delivered Prices)

Heavy melting	$32
No. 1 bundles	32
No. 2 bundles	32
Mechanical bundles	28
Mixed steel scrap	28
Mixed borings, turnings	28
Rails, remelting	32
Rails, rerolling	11
Busheling	28
Busheling new factory:	
Prep'd	30
Unprep'd	28
Short steel turnings	22

Cast Iron Grades

No. 1 machinery cast	46.00-50

† F.o.b., shipping point.

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Pallets loaded with motor stator laminations are easily lifted and moved with these floor-operated Tramrail cranes. Note that the entire area is jam-packed, with no lost aisle-way space. The ease with which any loaded pallet can be picked up and handled to awkward-to-reach places is a distinct advantage.

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Often 50% and more materials on pallets can be stored in a room served by overhead cranes. Narrowing of some aisles, elimination of others, plus higher and closer piling make the difference.

Pallet loads are moved safely and speedily overhead where the path is always clear and unobstructed. Placing this handling job near the ceiling, reduces floor congestion and frees much of it for other purposes.

Maintenance costs for Tramrail cranes are extremely low, usually only a few percent of that for power-operated floor trucks. No engines to overhaul. No clutches to replace. No brakes to re-line. No batteries to charge. No irritating gas fumes. And of importance, extra heavily reinforced floors are not required and costly floor damage because of materials handling is eliminated.

When considering pallet handling or any materials handling, it will pay you to look into the tremendous advantages that Cleveland Tramrail cranes offer.

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(bars) and Houston Iron & Steel Co., Houston, Tex., (structurals); Farnsworth & Chambers Co., New Orleans, general contractor.

500 tons, bars and shapes, auditorium, Massachusetts Institute of Technology, Cambridge, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; George A. Fuller Co., Boston, general contractor.

380 tons, housing project, Mass.-200-3, Chelsea, Mass., to Northern Steel Co., Boston; White Construction Co., Boston, general contractor.

220 tons, Woodrow Wilson high school, Portsmouth, Va., to Hall-Hodges Co., Inc., Norfolk, Va.; Cramer-Vollmerhausen Co., Washington, general contractor; Globe Iron Works, Norfolk, Va., structural steel.

110 tons, electronics and electrical shop, naval shipyard, Boston, to Concrete Steel Co., Boston; S. & A. Allen Construction Co., Inc., Boston, general contractor.

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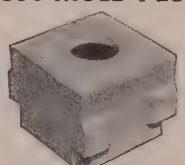

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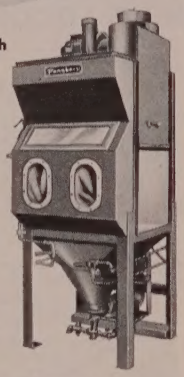

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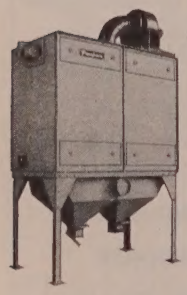

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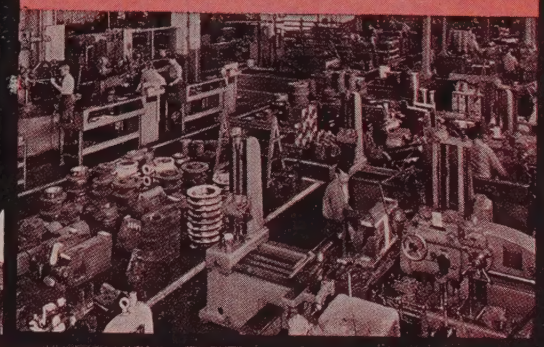

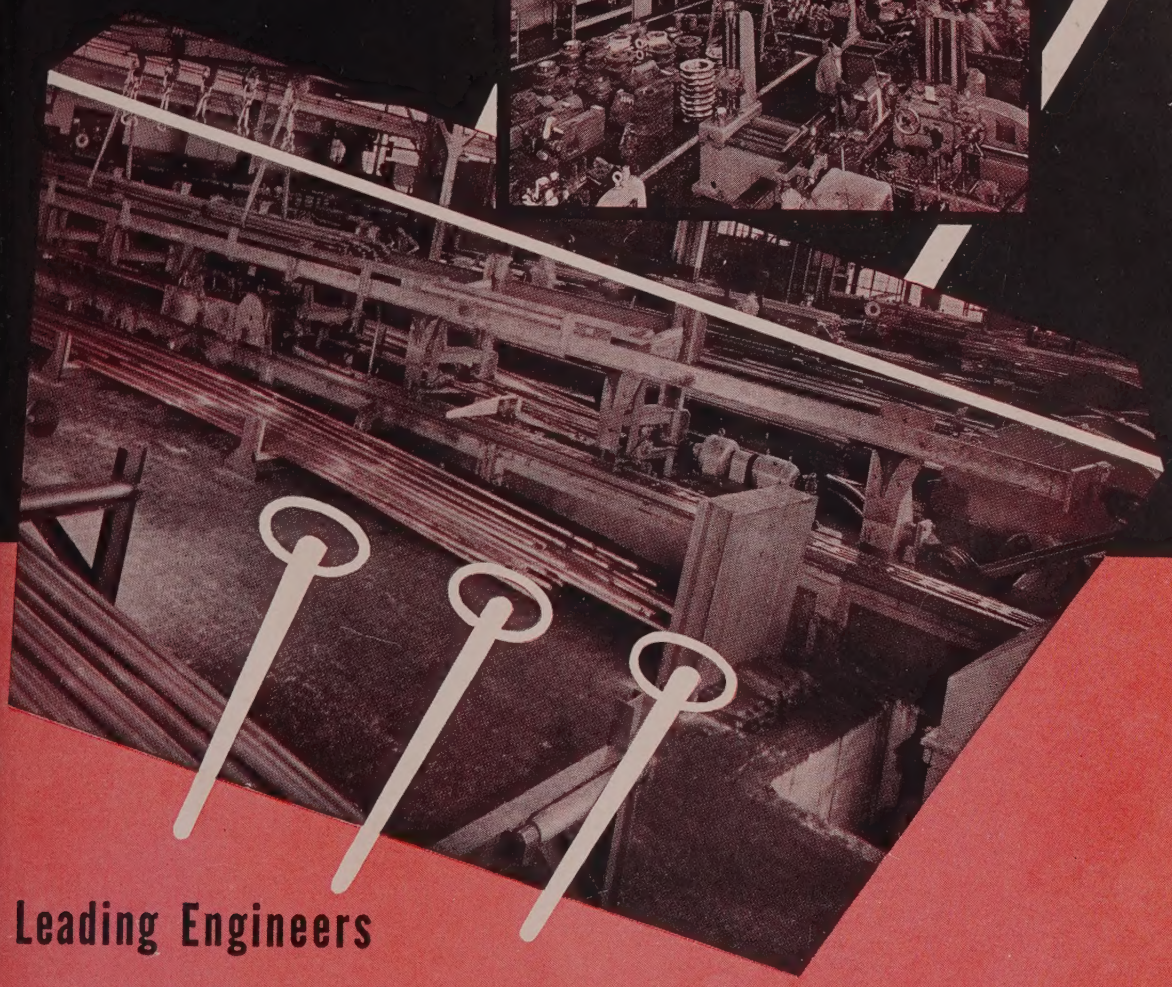

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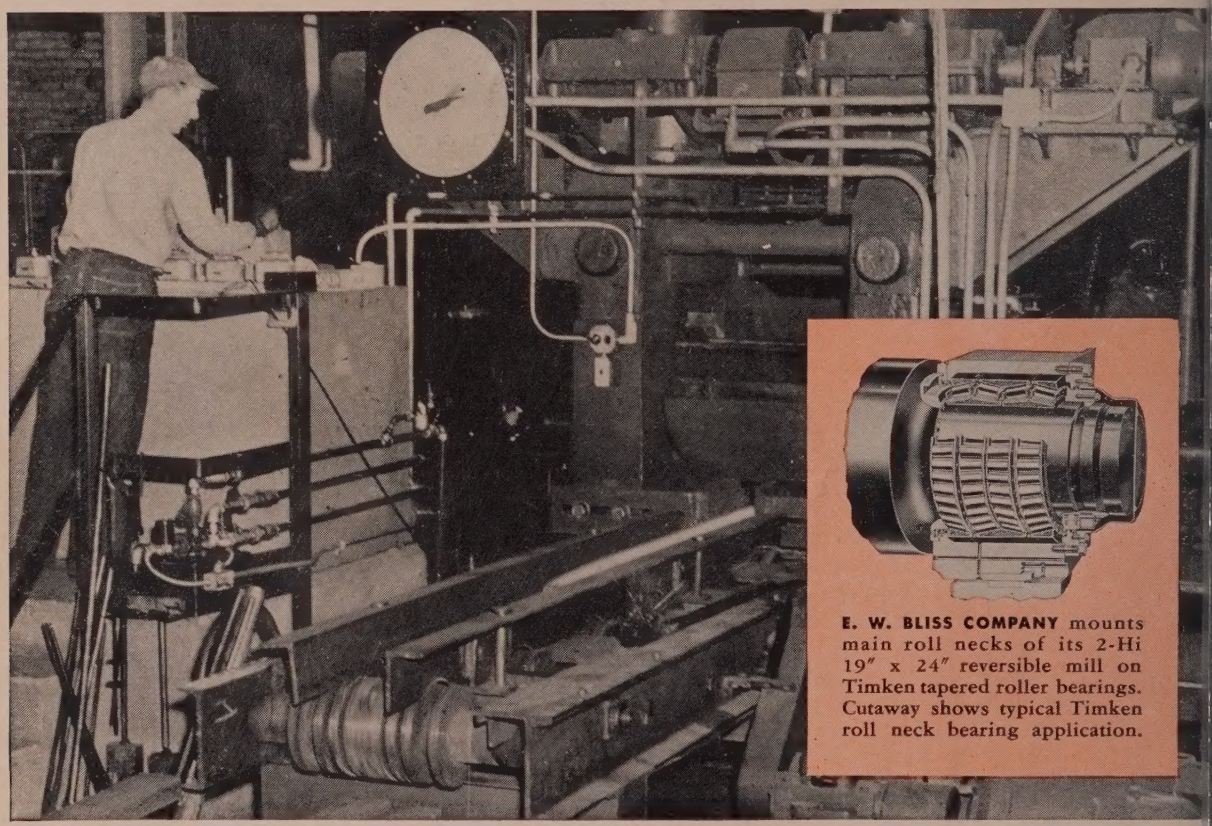
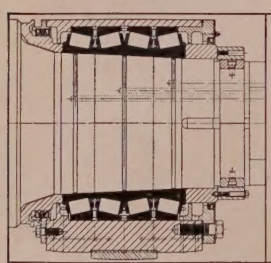


E. W. BLISS COMPANY mounts main roll necks of its 2-Hi 19" x 24" reversible mill on Timken tapered roller bearings. Cutaway shows typical Timken roll neck bearing application.



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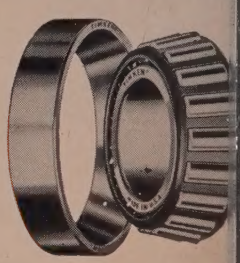

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